



## SECTION 4 COUNTY PROFILE

This profile describes the general information of the County (physical setting, population and demographics, general building stock, and land use and population trends) and critical facilities located within Morris County. In Section 5, specific profile information is presented and analyzed to develop an understanding of the study area, including the economic, structural, and population assets at risk and the particular concerns that may be present related to hazards analyzed (for example, a high percentage of vulnerable persons in an area).

### 2015 Plan Update Changes

- The “County Profile” is now located in Section 4; previously located in Section 3. It contains updated information regarding the county's physical setting, population and demographics and trends, general building stock, land use and trends, and critical facilities. Additionally, future development trends in the county are now included in Section 4.

### 4.1 GENERAL INFORMATION

Morris County is one of the fastest growing counties in the New York-New Jersey-Connecticut metropolitan region. It is located amid rolling hills, broad valleys, and lakes approximately 30 miles northwest of New York City. The County was created by an Act of the State Legislature on March 15, 1738, separating it from Hunterdon County. Morris County was named after Colonel Lewis Morris, then Governor of the Province of New Jersey (the area that now includes Morris, Sussex, and Warren Counties). During the Revolutionary War, the County was known as the military capital of the American Revolution due to its strategic location. General George Washington and his army made their winter camp near Morristown. Much of this area is now preserved today in the Morristown National Historical Park (Morris County 2015).

The Morris Canal was completed in 1831. It crossed the State from Phillipsburg to Newark, a distance of 90 miles, and played a major role in the movement of iron ore, coal and freight up until the 1920s when it was dismantled when it fell into disuse. In 1838, the tracks of the Morris & Essex Railroad reached Morristown and 10 years later, extended to Dover (Morris County 2015).

Since the turn of the century, the industry of Morris County changed from iron mining to research, pharmaceuticals and light manufacturing. The character of the land also changed from agricultural to residential. Today, Morris County is the seventh largest county in New Jersey and home to major shopping centers, large residential areas, and colleges and universities. Thirty-nine municipalities are found in the 477.8 square miles of the County (Morris County 2015).

#### 4.1.1 Physical Setting

This section presents the physical setting of the County, including: location, hydrography and hydrology, topography and geology, and climate.

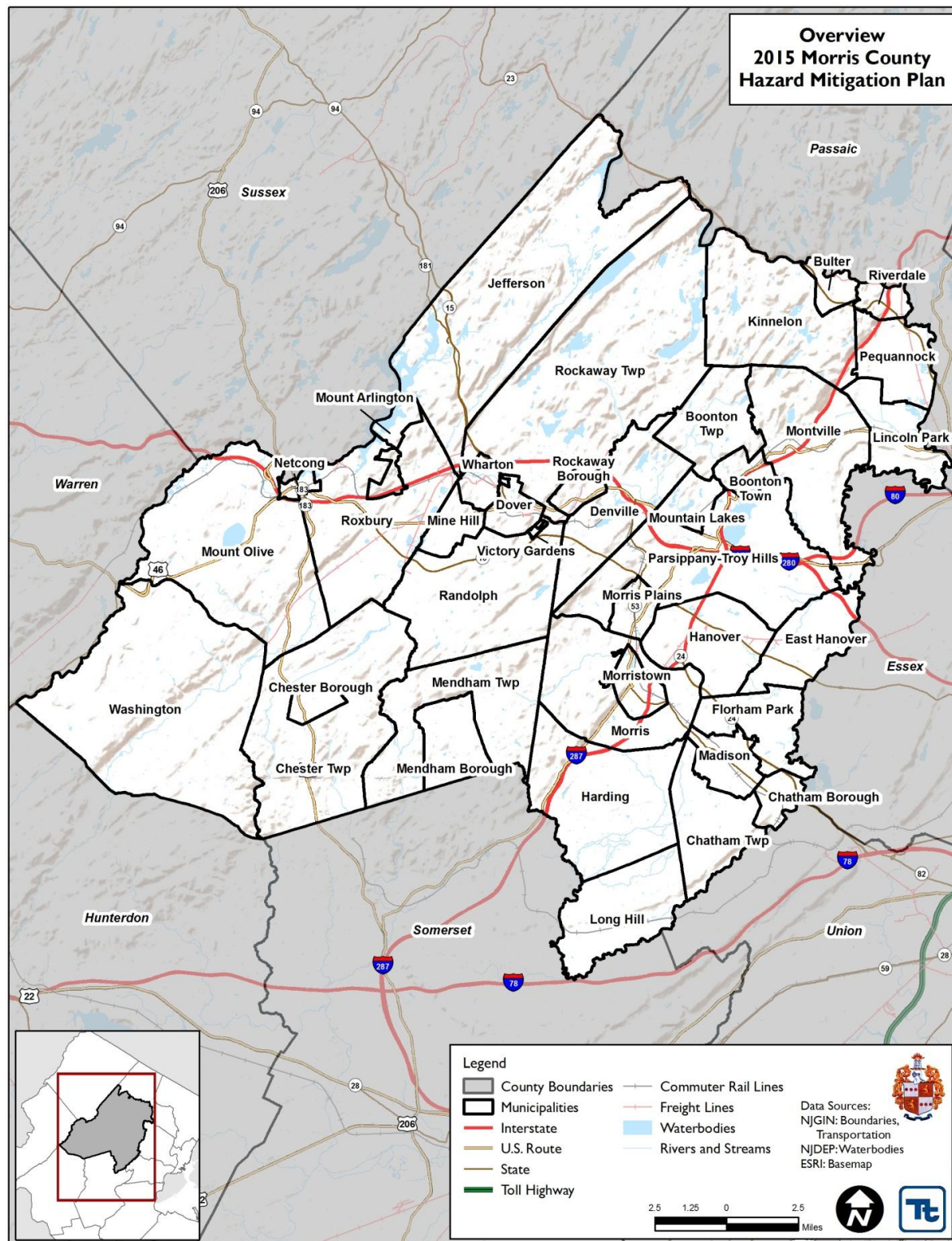
##### Location

Morris County is located in the north-central section of New Jersey and encompasses a total area of approximately 481 square miles. The County is bordered by Passaic County to the northeast, Essex County to the east, Union County to the southeast, Somerset County to the south, Hunterdon County to the southwest, Warren County to the west, and Sussex County to the north/northwest. Most of the county's borders are riverine borders. The northern boundary is characterized by the Peaquannock River. The Pompton River and the eastern



branch of the Passaic River serves as the eastern border for the county. The western border is characterized by the Musonnetcong River.

Figure 4-1. Overview Map Morris County, New Jersey



Source(s): NJGIN, NJDEP



## Hydrography and Hydrology

Numerous ponds, lakes, creeks, and rivers make up the waterscape of Morris County and include: Musconetcong River, North and South Branch Raritan River, Northern and Southern Tributary, Passaic River, Peapack River, Pequannock River, Pinch Brook, Pompton River, Primrose Brook, Ramapo River, Rockaway River, Silver Brook, Spring Garden Brook, Stephensburg Brook, Stonehouse Brook, Stony Brook, Susquehanna Brook, Tanglewood Brook, Tanners Brook, Troy Brook, Watnong Brook, Weldon Brook, West Brook, West Ditch, Western Tributary, Whippany River, White Meadow Brook, and Wills Brook (FEMA FIS 2010).

The rivers and streams within Morris County flow generally southwestward, following the trends of the Highlands. Exceptions to this are the east flowing Pequannock River, the Rockaway River which flows south out of Berkshire Valley and then east through a gap in the eastern Highlands, and the Passaic River which rises in southern Mendham Township, flows north through the Watchung Valley and turns eastward at Montville towards the Great Notch, Little Falls and Paterson (Morris County NRI 2000).

## Watersheds

A watershed is the area of land that drains into a body of water such as a river, lake, stream, or bay. It is separated from other systems by high points in the area such as hills or slopes. It includes not only the waterway itself but also the entire land area that drains to it. For example, the watershed of a lake would include not only the streams entering the lake but also the land area that drains into those streams and eventually the lake. Watersheds come in all shapes and sizes and can cross municipal and county boundaries.

Drainage basins generally refer to large watersheds that encompass the watersheds of many smaller rivers and streams. Morris County is encompassed by three major watershed basins: Delaware, Raritan and Passaic. Each of which are made up of smaller watersheds. Details regarding these water basins and watersheds are described below.

### Delaware River Basin

The Delaware River Basin rises in the Catskill Mountains in New York State and travels 330 miles through 13,500 square miles of rural and urban landscapes and empties into the Atlantic Ocean. In Morris County, this Basin only has a small percentage of area. The Musconetcong Watershed is the only watershed in Morris County that is part of this Basin.

The Musconetcong River watershed includes portions of Hunterdon, Morris, Warren, and Sussex Counties. The watershed is 157.6 square miles in size and drains the Musconetcong River. It includes Lake Hopatcong and several smaller lakes that drain to the River. The River forms the western boundary of the County and its watershed encompasses Jefferson Township, Mount Arlington Borough, Mount Olive Township, Netcong Borough, Roxbury Township, and Washington Township (Musconetcong Watershed Association 2015). In addition to the River and Lake Hopatcong, the Willis Brook, Mine Brook, Bungalow Brook and Stephensburg Brook are located within this watershed (Morris County NRI 2000).

### Passaic River Basin

The Passaic River Basin drains approximately 935 square miles of northern New Jersey and southern New York State. The Basin is divided into three regions, Highlands, Central Basin, and Lower Valley due to the amount and character of flooding within the Basin. The Highlands section of the Passaic River Basin drains approximately 489 square miles and most of the major tributaries to the Passaic River drain from the Highlands. These tributaries include the Whippany, Rockaway, Pequannock, Wanaque, Ramapo, and Pompton Rivers. These waterbodies are characterized by flash floods due to narrow and steep sided valleys. Flooding is common in the established municipalities of this section of the Basin (Passaic River Coalition 2015).





The Central Basin of the Passaic River Basin is made up of large areas of meadows and swamps. It extends from Long Hill Township in to the south to Pequannock Township in the north. Flooding has occurred primarily in Wayne, Lincoln Park (Morris County), Pequannock (Morris County), Pompton Lakes, and Fairfield. Lastly, the Lower Valley of the Basin extends from Little Falls to Newark Bay. It is 173 square miles in size and is the most extensively developed area of the Basin (Passaic River Coalition 2015).

Several watersheds make up the Passaic River Basin in Morris County, including the Upper Passaic, Whippany, Rockaway, and Pequannock River watersheds. The Upper Passaic River watershed is the most extensive of the County's major watersheds. The Passaic River provides riverine, open water and wetland habitats for wildlife and drinking water, fishing and recreational opportunities for those that live within the watershed. Waterbodies in the Upper Passaic include Primrose Brook, the Great Swamp, Great Brook, Black Brook, Loantaka Brook, Upper Passaic River, and Jersey Brook's (Morris County NRI 2000).

The Rockaway River watershed emanates in Sussex County and travels through Morris County. Prior to 1700, there were only four natural impoundments in Morris County: Green Pond, Split Rock Reservoir, Cranberry Pond, and one unnamed pond below Oak Ridge Lake. When the iron industry was booming in the County, the need for water impoundments, water supply, recreation, and real estate development resulted in the current number of water impoundments in the County, with a total of 23 lakes and 275 ponds. Today, the major waterbodies in the County include Mountain Lake, Upper Longwood Lake, Boonton Reservoir, Taylortown Reservoir, Splitrock Reservoir, White Meadow Lake, and Lake Denmark (Morris County NRI 2000).

The Whippany River watershed is an area of 69.3 square miles in Morris County. It is made up of small streams and tributaries that drain into the Whippany River. The River is 16 miles long and is one of the sources of drinking water for more than one million people in northern New Jersey. The watershed encompasses numerous municipalities in Morris County, including: Boonton Township, Boonton Town, Denville Township, Mountain Lakes Borough, Parsippany-Troy Hills Township, Randolph Township, Mendham Township and Borough, Harding Township, Morris Township, Morristown, Hanover Township, East Hanover Township, Florham Park Borough and Madison Borough (Whippany River Watershed Action Committee 2014). The major waterbodies of the Whippany River watershed include Troy Brook, Watnong Brook, Clyde Potts Reservoir, Speedwell Lake, and Pocahontas Lake (Morris County NRI 2000).

The Pequannock River watershed drains 90 square miles and travels 30 miles before joining with the Wanaque River. Its headwaters are in the highlands of Sussex County and the River serves as the political boundary between Morris and Passaic Counties. Most of the land in this watershed is forested and protected. The Newark Watershed Conservation and Development Corporation holds 35,200 acres to protect a supply of water that is stored in five major reservoirs: Canistear, Charlotteburg, Clinton, Oak Ridge Reservoirs and Echo Lake (New Jersey Audubon Society 2013). Numerous lakes, ponds and reservoirs make up the Pequannock River watershed, with the major waterbodies including Lake Kinnelon, Lake Kakeout, Charlottesburg Reservoir and Oak Ridge Reservoir (Morris County NRI 2000).

### Raritan River Basin

The Raritan River basin is the largest drainage area located entirely in New Jersey. The Basin contains portions of Morris, Hunterdon, Somerset, Mercer, Union, Middlesex, and Monmouth Counties. Approximately 1,100 square miles of the State's land drain into the Raritan Bay via the Raritan River and its tributaries while an additional 122 square miles is drained by the Shrewsberry and Navesink Rivers which empty into Sandy Hook Bay (New Jersey Audubon Society 2013). The South Branch Raritan River makes up the Basin and Morris County is located within its watershed. The South Branch drains almost 280 square miles as it winds 51 miles from western Morris County through central Hunterdon County and into western Somerset County, before combining with the North Branch. The South Branch begins in Morris County as the outflow of Budd Lake.



Major tributaries include the Neshanic River, Spruce Run creek, Mullhockaway Creek, and Cakepoulin Creek. Major impoundments are the Spruce Run Reservoir and Round Valley Reservoir (NJDEP Date Unknown).

### *Watershed Management Areas*

In 1996, the NJDEP began implementing a watershed management approach to maintaining the physical, chemical, and biological integrity of the State's waters. This approach concentrates on managing individual watershed areas by defining the physical geographic boundaries of the watersheds, basing water policy on sound scientific principles, and developing partnerships with the public. The NJDEP divided New Jersey into five water regions: the Northeast, Raritan, Northwest, Lower Delaware and Atlantic Coastal. Each water region is then divided into three to five watershed management areas (WMAs), for a total of 20 WMAs. Each WMA encompasses a particular group of major rivers and each consists of numerous smaller watersheds (USGS 2000). Morris County is located within the Raritan, Northwest and Northeast water regions. Additionally, the County is located in five of the 20 WMAs, which are described below (NJDEP 2007).

#### *WMA 1: Upper Delaware*

WMA 1 is also known as the Upper Delaware River Watershed and encompasses 746 square miles in the mountainous northwestern corner of the State. WMA 1 includes portions of Sussex, Morris, Hunterdon Counties and all of Warren County. In total, it contains 54 municipalities in New Jersey. Within WMA 1, there are six major drainage basins: Delaware River, Flat Brook, Paulins Kill, Pequest River, Lopatcong and Pohatcong River Drainage, and the Musconetcong River. These drainage basins flow in a southeasterly direction to the Delaware River, providing an outstanding recreational resource for trout production and maintenance, as well as habitat for an abundance of wildlife including threatened and endangered species (NJDEP 2014).

#### *WMA 3: Pompton, Pequannock, Wanaque, Ramapo*

WMA 3 is located within the water-rich Highlands Province of New Jersey. The Pequannock, Wanaque and Ramapo Rivers all flow into the Pompton River. The Pompton River is, in turn, a major tributary to the Upper Passaic River. WMA 3 contains some of the State's major water supply reservoir systems including the Wanaque Reservoir, the largest surface water reservoir in New Jersey. There are four watersheds in WMA 3: Pompton, Ramapo, Pequannock and Wanaque River Watersheds. WMA 3 lies mostly in Passaic County but also includes parts of Bergen, Morris and Sussex Counties (NJDEP 2014).

#### *WMA 4: Lower Passaic, Saddle River*

WMA 4 includes the Lower Passaic River (from the Pompton River confluence downstream to the Newark Bay) and its tributaries, including the Saddle River. The WMA 4 drainage area is approximately 180 square miles and lies within portions of Passaic, Essex, Hudson, Morris and Bergen Counties. Two watersheds makeup WMA 4: the Lower Passaic River Watershed and Saddle River Watershed. The Lower Passaic River Watershed originates from the confluence of the Pompton River downstream to the Newark Bay. This 33-mile section meanders through Bergen, Hudson, Passaic and Essex Counties and includes a number of falls, culminating with the Great Falls in Paterson. This watershed has a drainage area of approximately 129 square miles. The major tributaries to this section of the Passaic River are the Saddle River, Preakness Brook, Second River and Third River. The Saddle River is one of the larger tributaries to the Lower Passaic River. The Saddle River Watershed has a drainage area of approximately 51 square miles. Land in this watershed is extensively developed and contains many older cities and industrial centers including Newark, Paterson, Clifton and East Orange (NJDEP 2014).

#### *WMA 6: Upper and Mid Passaic, Whippany, Rockaway*

WMA 6 represents the area drained by waters from the upper reaches of the Passaic River Basin including the Passaic River from its headwaters in Morris County to its confluence with the Pompton River. WMA 6 is characterized by extensive suburban development and reliance upon groundwater sources for water supply. It



lies within portions of Morris, Somerset, Sussex and Essex Counties and includes the Upper and Middle Passaic River, Whippany River and Rockaway River Watersheds (NJDEP 2014).

#### *WMA 8: North and South Branch Raritan*

WMA 8 includes the North and South Branches of the Raritan River and their tributaries. Large portions of Somerset, Hunterdon, and Morris Counties are included in this land area. The North Branch of the Raritan River is 23 miles long and flows from northwestern Morris County through Somerset County to the confluence with the South Branch between the towns of Branchburg and Raritan (Somerset County). Major tributaries include the Peapack Brook, Rockaway Creek and Lamington River and the only major impoundment is Ravine Lake. Land use in the North Branch Raritan River Watershed is primarily rural, woodland and agricultural with scattered areas of commercial and residential but there is intense development along the major road corridors. There are over 20 NJPDES permitted discharges and 51 biological monitoring stations in this watershed (NJDEP 2014).

The South Branch of the Raritan River is 51 miles long and flows from western Morris County through central Hunterdon County into western Somerset County before joining the North Branch. Major tributaries include the Neshanic River, Spruce Run Creek, Mulhockaway Creek and Cakepoulin Creek and major impoundments are the Spruce Run and Round Valley Reservoirs. Land use in the South Branch Raritan River Watershed is mostly agricultural, but suburban-industrial development is increasing at a rapid rate. There are approximately 23 NJPDES permitted discharges and 51 biological monitoring stations in this watershed (NJDEP 2014).

#### **Topography and Geology**

Hills and valleys run east-west, with rocky out-croppings as high as 1,000 feet above sea level in the County. Morris County is located within two physiographic provinces: the Highlands Province from to the north and west and the Piedmont Province to the east and southeast.

The Highlands portion of the county is characterized by a series of discontinuous rounded ridges separated by deep and narrow valleys. In general, this area of the County is located high above sea level. Landforms within the Highlands include generally northeast trending ridges and valleys gradually dropping in elevation from west to east. A 200 to 400 foot border escarpment on the eastern edge, traversing the County from the Borough of Kinnelon through Morristown and separates the Highlands from the adjacent Piedmont. Morris County is mostly encompassed by the Highlands Province and consists mainly of Precambrian gneissic bedrock underlain by limestone, sandstone, or shale bedrock in the area's valley regions (USDA 1976; Morris County NRI 2000).

The Piedmont portions of Morris County are characterized by low rolling plains divided by higher ridges. In the area of the County where the Highlands Province meets the Piedmont Province, the land is approximately 300 to 400 feet above sea level. The land then slopes downward towards the south and eastern portions of the county (NJDEP 2006). In the Piedmont Province area of the County, the ground mainly consists of soft red shale also known as Brunswick shale or sandstone bedrock.

#### **Climate**

The climate of Morris County is mostly a temperate continental climate with some moderate maritime influences. Winter climate is controlled by polar continental air masses; summer climate by tropical air masses moving up over the United States from the Gulf of Mexico. Precipitation is fairly evenly distributed from month to month, with an average of three to four inches per month in the fall, winter and spring. The average annual precipitation is 44.1 inches, with approximately 50 inches of and 35 inches of snow falling each year. Average seasonal temperatures range from 29.2°F in January and 74.5°F in July; however, it varies widely from area to area in the County (Morris County 2015; FEMA FIS 2010).



### Land Use, Land Cover, and Land Use Trends

Local zoning and planning authority is provided for under the New Jersey Municipal Land Use Law, which gives municipalities zoning and planning authority. DMA 2000 requires that communities consider land use trends, which can impact the need for, and priority of, mitigation options over time. Land use trends significantly impact exposure and vulnerability to various hazards. For example, significant development in a hazard area increases the building stock and population exposed to that hazard.

This plan provides a general overview of population and land use and types of development occurring within the study area. An understanding of these development trends can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place to protect human health and community infrastructure.

Morris County is one of the largest Counties in the State and has a diverse landscape; the majority of the county is either forested or developed land. In 2002, the majority or 39.78 percent of the land in Morris County was forested land. The 2007 figures show a slight decrease in total forested land, which was 38.66 percent of the County. In 2002 37.16 percent was urban land; 14.10 percent was wetlands land; 1.05 percent was barren land; and 4.33 percent was agricultural lands. When compared with the land use land cover data set from 2007, there has been a decrease in agricultural land (-4.6 percent), barren land (-16 percent), forest (-2.8 percent) and wetlands (-0.8 percent), while there was an increase in urban land use (+ 4.1 percent). Refer to Table 4-1 and Figure 4-2 below.

**Table 4-1. Land Use Summary for Morris County, 2002 & 2007**

Land Use Category	2002 Data		2007 Data	
	Acreage	Percent of Morris County	Acreage	Percent of Morris County
Agriculture	13,353.70	4.33%	12,733.32	4.13%
Barren	3,237.77	1.05%	2,709.99	0.88%
Forest	122,565.72	39.78%	119,132.19	38.66%
Urban	114,486.72	37.16%	119,135.15	38.67%
Wetlands	43,453.39	14.10%	43,103.74	13.99%

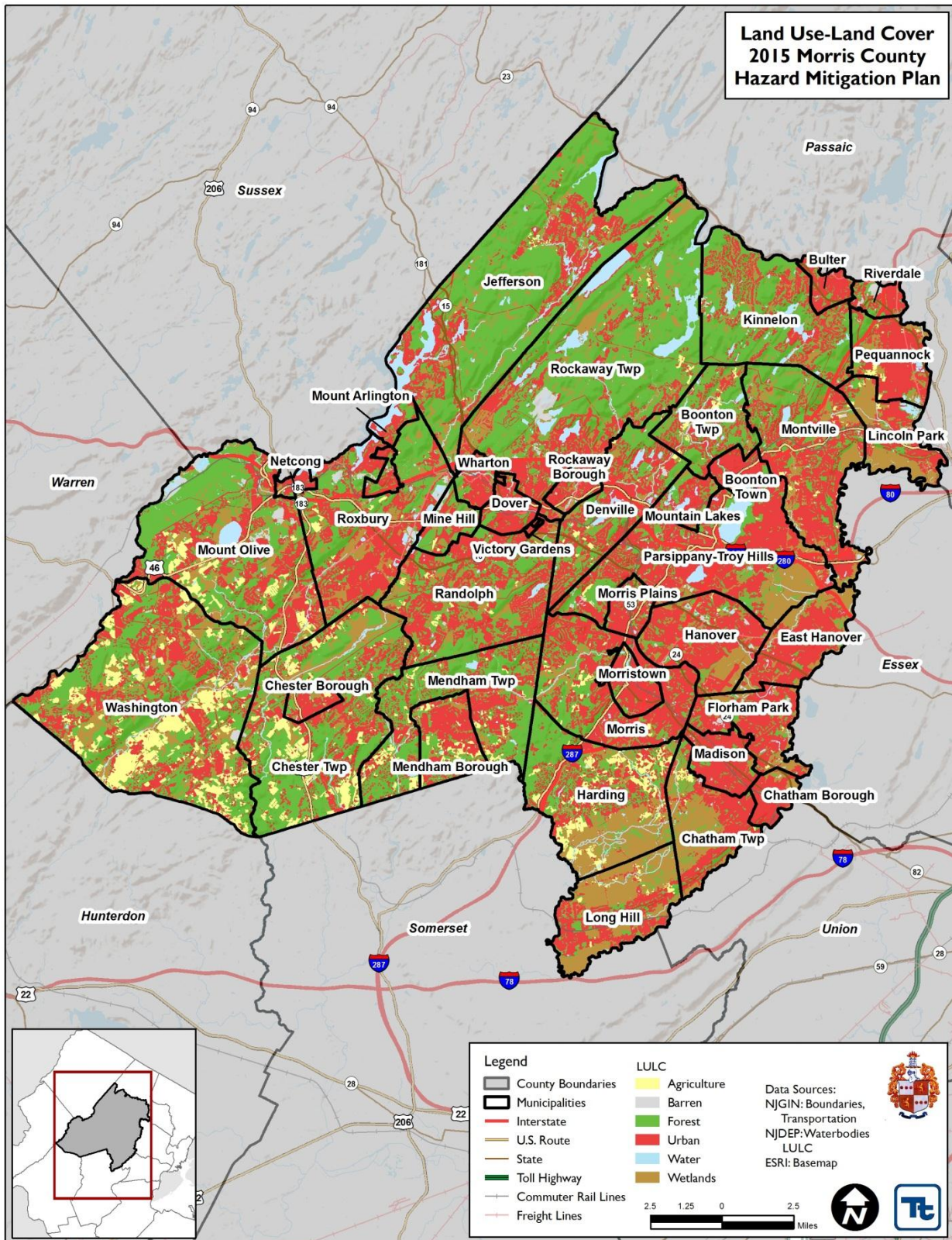
Source: NJDEP (2007 LULC)

Note: Urban land includes residential, industrial, transportation, and recreational land. Water is excluded from the table above.





Figure 4-2. 2007 Land Use Land Cover for Morris County



Source: NJDEP 2007







### Highlands Region of New Jersey

The New Jersey Highlands is a 1,343 square mile area (over 800,000 acres) in the northwest portion of New Jersey. It is noted for its scenic beauty and environmental significance. The Highlands stretches from Phillipsburg (Warren County) in southwest New Jersey to Ringwood (Passaic County) in the northeast. The Highlands Region lies within portions of seven counties, Hunterdon, Somerset, Sussex, Warren, Morris, Passaic and Bergen, and includes 88 municipalities. The Highlands Act designates approximately 398,000 acres as the Highlands Preservation Area which is identified as an area of exceptional natural resource value. The remainder of the Highlands Region that is not located within the Preservation Area lies within the Highlands Planning Area.

All of Morris County is located within the New Jersey Highlands. Northern and southwestern Morris County are located in the Highlands Preservation Area and the remainder of the County is located within the Highlands Planning Area.

### Agriculture

In 2012, there were 366 farms in Morris County, a decrease of 13% from 2007 which had 422 farms. The farms in the County cover 14,458 acres, again, a decrease since 2007 (17,028 acres) (USDA 2012). Over the last 20 years, farming in the County has shifted from livestock to nursery products. Many farms in Morris County operate seasonal and/or year-round farm markets or farm stands which provide the farms direct links to their customers. Nearly every municipality in Morris County contains several acres of farmland, with Washington Township having the largest area of land used for farmland (10,815 acres or 37.7% of the Township's total land area) (Morris County Planning 2014).

### Open Space and Parkland

The Morris County Park Commission includes 38 facilities: historic sites, golf courses, outdoor educational and recreational facilities, arboreta, conservation areas, 150 miles of trails, and ice skating arena. The Commission is the largest park system in New Jersey (based on acreage) with more than 17,500 acres of passive and active recreational opportunities throughout the County. This includes golf, hiking, ice skating, sledding, ice fishing, fishing, boating, swimming, cross-country skiing, snowshoeing, biking, recreational fields, environmental education and special programming throughout the year. The largest wildlife preserves in the County are the Mahlon Dickerson Reserve in Jefferson Township and Silas Condict Park in Kinnelon. Table 4-2 identifies the Morris County and New Jersey State parks located throughout the County.

**Table 4-2. County and State Parks in Morris County**

Park	Acreage	Municipality
Allamuchy Mountain and Stephens State Park	2,440	Mount Olive Township
Bamboo Brook Outdoor Education Center	100	Chester Township
Cooper Gristmill	N/A	Chester Township
Craigmeur Recreation Complex	130	Jefferson Township and Rockaway Township
Elizabeth D. Kay Environmental Center	223	Chester Township
Fosterfields Living Historical Farm	200	Morris Township
Frelinghuysen Arboretum	127	Morris Township
Great Swamp Outdoor Education Center	7,500	Chatham Township
Hacklebarney State Park	978	Chester Township
Hedden Park	380	Dover, Mine Hill, and Randolph
Historic Speedwell	7.5	Morristown



Park	Acreage	Municipality
James Andrews Memorial Park	75	Randolph Township
Lee's Park Marina	N/A	Mount Arlington Borough
Lewis Morris Park	1,154	Harding, Mendham and Morris Townships
Loantaka Brook Reservation	570	Morristown
Mahlon Dickerson Reservation	3,200	Jefferson Township
Mennen Sports Arena	N/A	Morris Township
Mount Hope Historical Park	391	Rockaway Township
Mount Paul Memorial Park	285	Chester Township
Old Troy Park	96	Parsippany-Troy Hills Township
Passaic River Park	769	Chatham and Long Hill Townships
Patriots' Path	35 miles	Throughout the County
Pyramid Mountain Natural Historic Area	1,500	Kinnelon Borough and Montville Township
Schooley's Mountain Park	797	Washington Township
Seaton Hackney Farm	38	Morris Township
Silas Condict Park	1,508.75	Kinnelon Borough
Tourne Park	546.9	Denville Township
Traction Line Recreation Trail	2 miles	Madison Borough, Morristown and Morris Township
Willowood Arboretum	130	Chester Township

Source: Morris County Park Commission  
N/A Not Available

### Urban Land

Urban land includes most of what normally would be considered developed land. Residential areas, commercial areas, services and institutions, industrial areas, and those developed for transportation and utilities are the primary land uses included in urban land. There are several other open land categories that are included with urban land. Developed recreation areas, whether a part of a park, educational facility, or private concern (e.g. golf course), are also considered a part of urban land. Also included are areas such as large, landscaped lawns in corporate businesses and service centers, parks, and residential areas (NJDEP, 2014). The following table identifies the urbanized municipalities in Morris County, based on NJDEP 2002 land use/land cover data. Urbanized municipalities in Morris County are those communities where 90% or more of the total land is considered urban.

**Table 4-3. Urban Municipalities in Morris County**

Municipality	Population (2010 Census)	Land Area (Square Miles)	Population per Square Mile
Boonton Town	8,347	2.34	3,575
Butler	7,539	2.04	3703
Chatham Borough	8,962	2.37	3776
Dover	18,157	2.68	6766
Madison	15,845	4.21	3768
Morristown	18,411	2.93	6285
Rockaway Borough	6,438	2.07	3107
Victory Gardens	1,520	0.15	10,419
Wharton	6,522	2.15	3039

Source: Morris County Department of Planning and Public Works, 2011



## 4.2 POPULATION AND DEMOGRAPHICS

DMA 2000 requires that HMPs consider the risk and vulnerability of socially vulnerable populations to natural hazards. These populations can be more susceptible to hazard events, based on a number of factors including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing. For the purposes of this study, vulnerable populations shall include (1) the elderly (persons aged 65 and over) and (2) those living in low-income households.

### 4.2.1 Population Characteristics

According to the 2010 U.S. Census, Morris County had a population of 492,276 people which represents a significant increase from the 2000 U.S. Census population of 470,212 people. HAZUS-MH demographic data will be used in the loss estimating analyses in Section 5 of this plan. All demographic data in HAZUS corresponds to the 2000 U.S. Census data. Table 4-4 presents the population statistics for Morris County based on the 2000 and 2010 U.S. Census data. Figure 4-3 shows the distribution of the general population density (persons per square mile) in 2010 by Census block. For the purposes of this plan, the 2010 Census was used where the data was available and supplemented with HAZUS-MH data (representing 2000 data).

**Table 4-4. Morris County Population Statistics**

Municipality	U.S. Census 2010			U.S. Census 2000*				
	Total	Pop. 65+	% Pop. 65+	Total	Pop. 65+	Percent Pop. 65+	Low-Income Pop.*	% Low-Income Pop. of Total
Town of Boonton	8,347	1,098	13.15%	8,496	1,183	13.92%	388	4.57%
Township of Boonton	4,263	770	18.06%	4,287	620	14.46%	67	1.56%
Borough of Butler	7,539	995	13.20%	7,420	987	13.30%	359	4.84%
Chatham Borough	8,962	912	10.18%	8,460	1,080	12.77%	145	1.71%
Chatham Township	10,452	1,582	15.14%	10,086	1,356	13.44%	174	1.73%
Chester Borough	1,649	291	17.65%	1,635	226	13.82%	68	4.16%
Chester Township	7,838	1,036	13.22%	7,282	661	9.08%	73	1.00%
Denville Township	16,635	2,618	15.74%	15,824	2,350	14.85%	426	2.69%
Town of Dover	18,157	1,914	10.54%	18,188	1,933	10.63%	900	4.95%
Township of East Hanover	11,157	2,149	19.26%	11,393	1,699	14.91%	260	2.28%
Borough of Florham Park	11,696	1,967	16.82%	8,857	1,802	20.35%	218	2.46%
Township of Hanover	13,712	2,486	18.13%	12,898	1,905	14.77%	235	1.82%
Township of Harding	3,838	805	20.97%	3,180	514	16.16%	27	0.85%
Township of Jefferson	21,314	2,297	10.78%	19,717	1,665	8.44%	529	2.68%
Borough of Kinnelon	10,248	1,248	12.18%	9,365	821	8.77%	152	1.62%
Borough of Lincoln Park	10,521	1,673	15.90%	10,930	1,585	14.50%	306	2.80%
Township of Long Hill	8,702	1,280	14.71%	8,777	1,115	12.70%	208	2.37%
Borough of Madison	15,845	2,256	14.24%	16,530	2,142	12.96%	509	3.08%
Borough of Mendham	4,981	946	18.99%	5,097	869	17.05%	181	3.55%
Township of Mendham	5,869	735	12.52%	5,400	570	10.56%	38	0.70%
Township of Mine Hill	3,651	447	12.24%	3,679	494	13.43%	122	3.32%





Table 4-4. Morris County Population Statistics

Municipality	U.S. Census 2010			U.S. Census 2000*				
	Total	Pop. 65+	% Pop. 65+	Total	Pop. 65+	Percent Pop. 65+	Low-Income Pop.*	% Low-Income Pop. of Total
Township of Montville	21,528	3,132	14.55%	20,839	2,219	10.65%	475	2.28%
Borough of Morris Plains	5,532	3,890	70.32%	5,236	824	15.74%	96	1.83%
Township of Morris	22,306	918	4.12%	21,796	3,286	15.08%	462	2.12%
Town of Morristown	18,411	2,110	11.46%	18,544	2,285	12.32%	1,065	5.74%
Borough of Mount Arlington	5,050	1,031	20.42%	4,663	490	10.51%	151	3.24%
Township of Mount Olive	28,117	2,531	9.00%	24,193	1,471	6.08%	562	2.32%
Borough of Mountain Lakes	4,160	2,531	60.84%	4,256	383	9.00%	34	0.80%
Netcong Borough	3,232	440	13.61%	2,580	373	14.46%	145	5.62%
Township of Parsippany-Troy Hills	53,238	7,297	13.71%	50,649	5,713	11.28%	1,703	3.36%
Township of Pequannock	15,540	3,865	24.87%	13,888	1,953	14.06%	369	2.66%
Township of Randolph	25,736	2,377	9.24%	24,847	1,816	7.31%	349	1.40%
Borough of Riverdale	3,559	535	15.03%	2,498	298	11.93%	78	3.12%
Borough of Rockaway	6,438	78	1.21%	6,473	790	12.20%	256	3.95%
Township of Rockaway	24,156	3,416	14.14%	22,930	2,213	9.65%	475	2.07%
Township of Roxbury	23,324	2,938	12.60%	23,883	2,414	10.11%	648	2.71%
Borough of Victory Gardens	1,520	95	6.25%	1,546	96	6.21%	82	5.30%
Township of Washington	18,533	2,104	11.35%	17,592	1,408	8.00%	344	1.96%
Borough of Wharton	6,522	764	11.71%	6,298	717	11.38%	319	5.07%
<b>Morris County (Total)</b>	<b>492,276</b>	<b>68,155</b>	<b>13.84%</b>	<b>470,212</b>	<b>54,326</b>	<b>11.55%</b>	<b>12,998</b>	<b>2.76%</b>

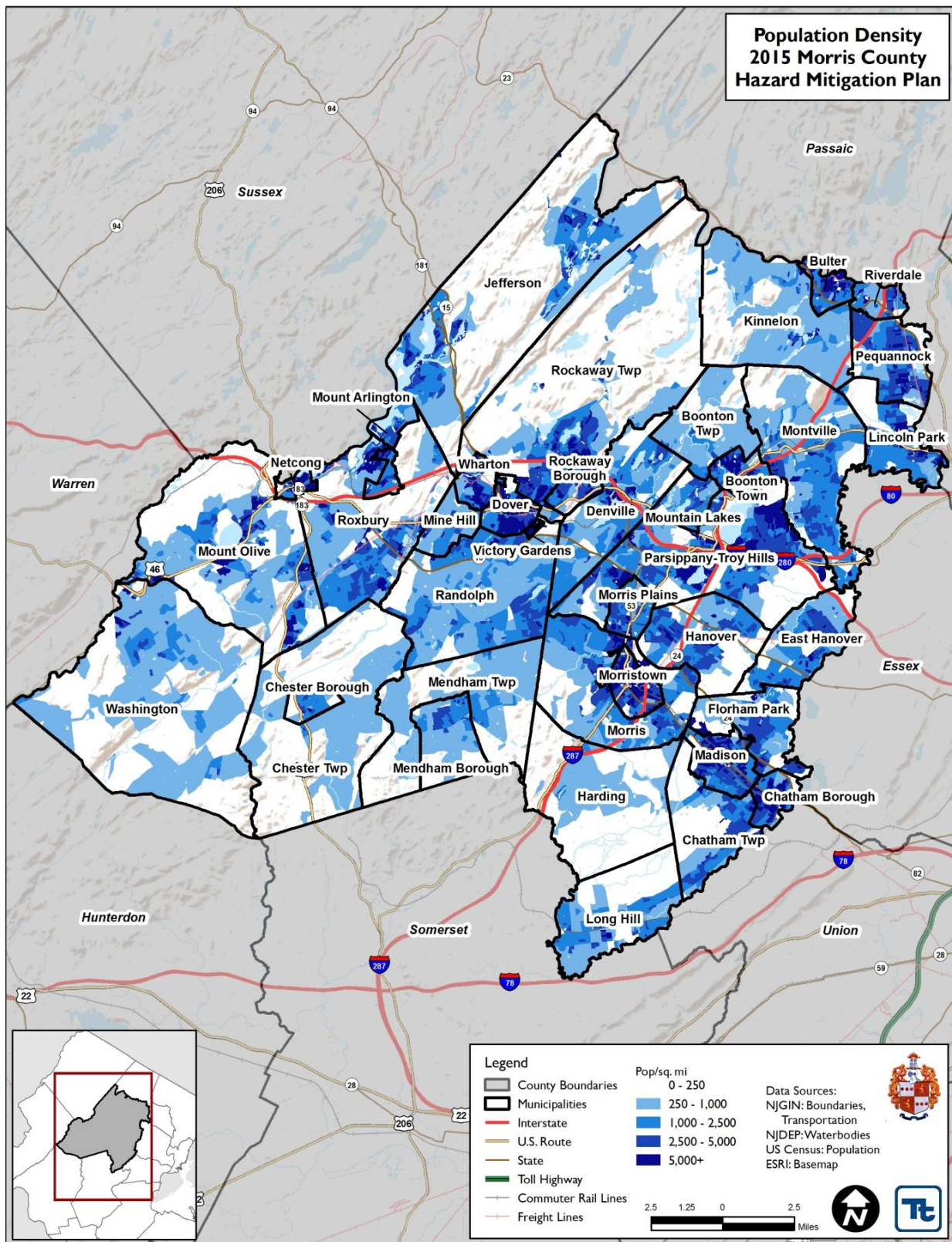
Source: Census 2010 (U.S. Census Bureau); HAZUS-MH (for 2000 U.S. Census data)

Note: Pop. = population

\* Individuals below poverty level (Census poverty threshold for a 3-person family unit is approximately \$18,500)



Figure 4-3. Distribution of General Population for Morris County, New Jersey



Source: U.S. Census 2010



### 4.2.2 Vulnerable Populations

Identifying concentrations of vulnerable populations can assist communities in targeting preparedness, response and mitigation actions. For the purposes of this planning process, vulnerable populations in Morris County include children, elderly, low-income, the physically or mentally disabled, non-English speakers and the medically or chemically dependent.

#### Age

Children are considered vulnerable because they are dependent on others to safely access resources during emergencies. The elderly are more apt to lack the physical and economic resources necessary for response to hazard events and are more likely to suffer health-related consequences making recovery slower. Those living on their own may have more difficulty evacuating their homes. The elderly are also more likely to live in senior care and living facilities (described in Section 4.6) where emergency preparedness occurs at the discretion of facility operators.

According to the 2010 Census, the median age in Morris County was 41.3 years. Of the 2010 population, 68,155 (13.8%) of the County's population is age 65 and older. According to the 2000 Census, 11.6% of the County's total population (or 54,326 persons) were age 65 and older. Figure 4-4 shows the distribution of persons over age 65 in Morris County. According to the 2010 Census, 103,023 (20.9%) people were age 16 or younger; 105,127 people (22.4%) were age 16 or younger according to the 2000 Census. Figure 4-6 shows the distribution of person under age 16 in Morris County.

#### Income

Of the total population, economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions based on the major economic impact to their family and may not have funds to evacuate. Based on the 2009-2013 American Community Survey five-year estimates, per capita income in Morris County was estimated at \$48,814 and the median household income for Morris County is \$98,633 (in 2013 inflation-adjusted dollars). It is estimated that over 14.1% of households receive an income between \$50,000 and \$74,999 per year and 17% of households receive over \$200,000 annually.

The 2012 U.S. Census American Community Survey data identified approximately 17,249 households as having an annual income of less than \$25,000 and are therefore below the poverty level. According to the Census' 2013 poverty thresholds, the weighted average thresholds for a family of four in 2013 was \$23,834; for a family of three, \$18,552; for a family of two, \$15,142, and for unrelated individuals, \$11,888. Figure 4-5 shows the distribution of low income persons.

It is noted that the Census data for household income provided in HAZUS-MH includes two ranges (\$0-10,000 and \$10,000-\$20,000/year) that were totaled to provide the "low-income" data used in this study. This does not correspond exactly with the "poverty" thresholds established by the 2013 U.S. Census Bureau, which identifies households with three adults and no children with an annual household income below \$18,222 per year, or households with one adult and two children with an annual household income below \$18,769 per year as "low income" for this region. This difference is not believed to be significant for the purposes of this planning effort.

#### Physically or Mentally Disabled

Based on the 2009-2013 American Community Survey, the total non-institutionalized population of Passaic County is 491,293, which is approximately 99% of the total population. Approximately 37,386 of those residents are living with a disability. About 7.7% of these residents are under the age of 18 and about 53.3% are 65 years or older.





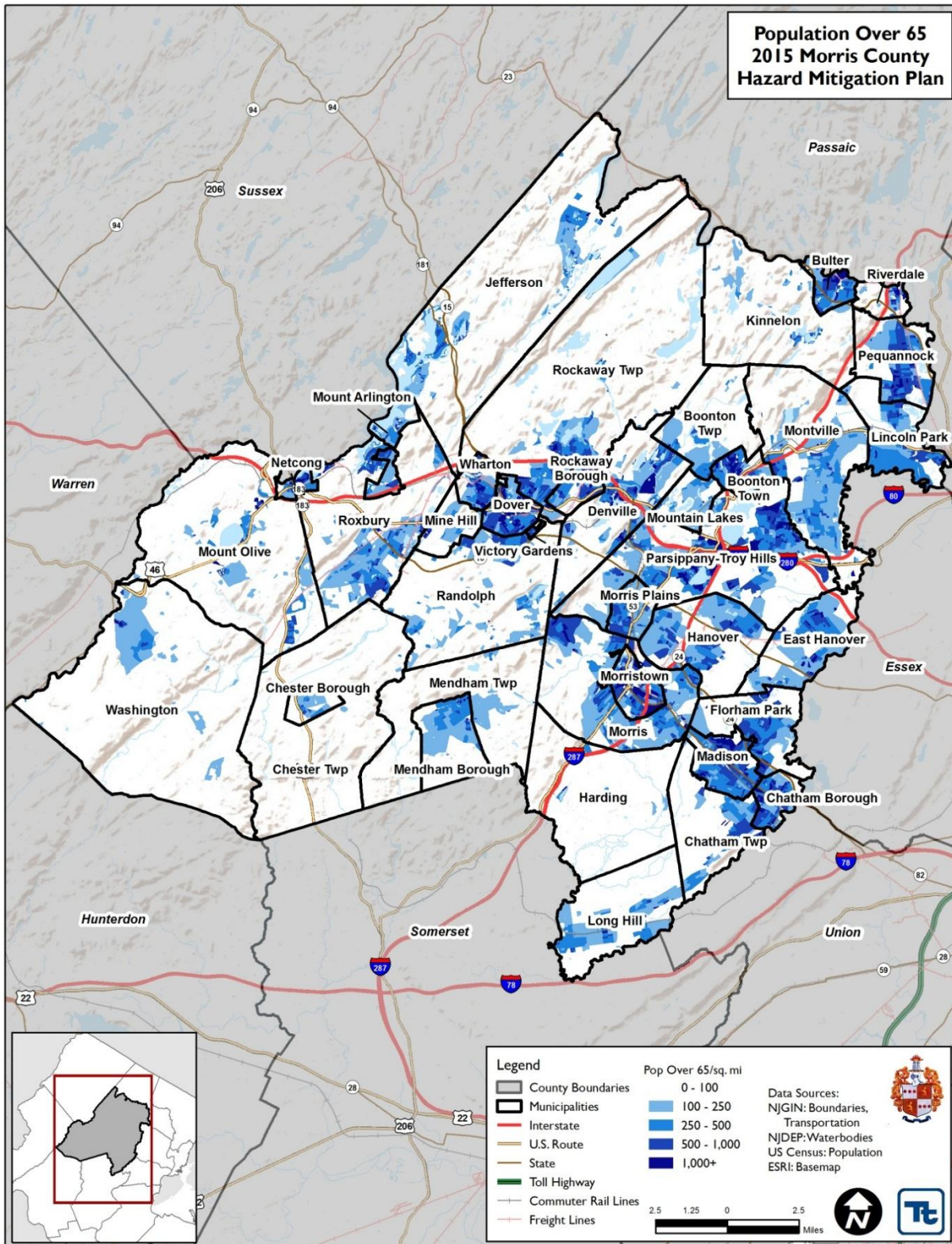
### **Non-English Speakers**

According to the 2009-2013 American Community Survey, 23.9% of the County's population over the age of 5 primarily speaks a language other than English at home; this is slightly lower than the State average of 30.0%. The greatest population of non-English speakers is Spanish-speaking residents, which make up approximately 10.1% of the population. Of the communities in Morris County, the Towns of Dover (72.8%) and Morristown (40.4%) and the Borough of Wharton (45.3%) have the largest proportion of non-English speaking households in the County. The primary non-English language spoken in these homes is Spanish; this is most prevalent in the Town of Dover, where 68.5% of the population speaks Spanish at home.

DRAFT



Figure 4-4. Distribution of Persons over the Age of 65 in Morris County, New Jersey



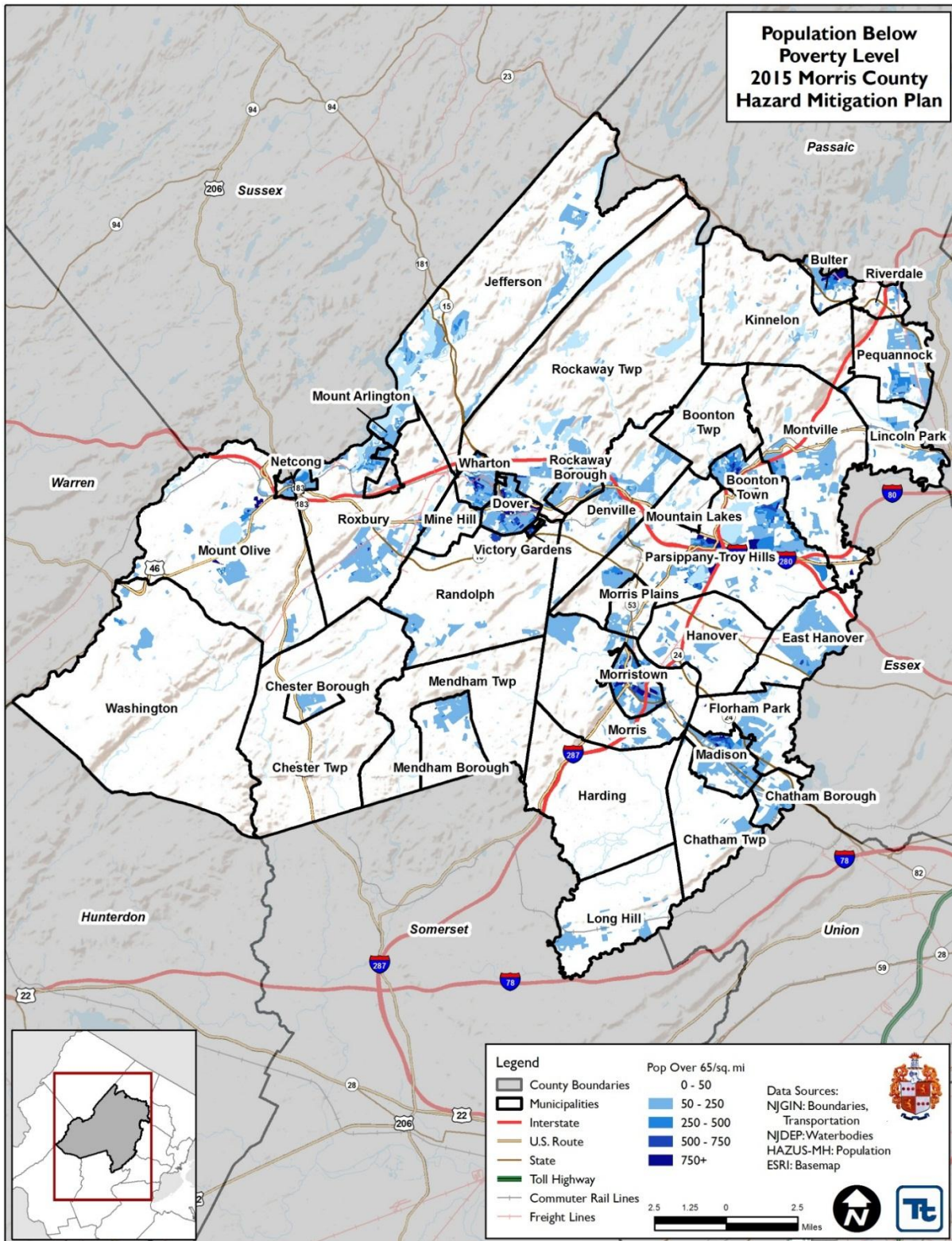
Source: HAZUS-MH

Note: Distribution is based on Census Block designations.





Figure 4-5. Distribution of Low-Income Population in Morris County, New Jersey



Source: HAZUS-MH

Note: Distribution is based on Census Block designations.





**Population Under 16  
2015 Morris County  
Hazard Mitigation Plan**

Passaic

Bulter Riverdale

Kinnelon

Pequannock

Lincoln Park

Montville

Boonton Twp

Boonton Town

Denville

Mountain Lakes

Parsippany-Troy Hills

East Hanover

Essex

Jefferson

Rockaway Twp

Rockaway Borough

Dover

Wharton

Netcong

Mount Arlington

Roxbury

Mine Hill

Victory Gardens

Randolph

Morris Plains

Hanover

Morristown

Morris

Harding

Long Hill

Washington

Mount Olive

Chester Borough

Chester Twp

Mendham Twp

Mendham Borough

Chatham Twp

Chatham Borough

Madison

Florham Park

Warren

Sussex

Hunterdon

Somerset

Union

206 94 181 15 183 46 287 78 82 28 59 22

Legend

County Boundaries

Municipalities

Interstate

U.S. Route

State

Toll Highway

Commuter Rail Lines

Freight Lines

Pop Under 16/sq. mi

0 - 100

100 - 250

250 - 500

500 - 1,000

1,000+

Data Sources:

NJGIN: Boundaries, Transportation

NJDEP: Waterbodies

US Census: Population

ESRI: Basemap

2.5 1.25 0 2.5 Miles

North Arrow

TE

*Note: Distribution is based on Census Block designations.*



### **Metropolitan Statistical Area (MSA)**

Metropolitan statistical areas are geographic entities delineated by the New Jersey Office of Management and Budget (OMB) for use by Federal statistical agencies in collecting, tabulating, and publishing Federal statistics. The general concept of a metropolitan area is that of a large nucleus, together with adjacent communities, having a high degree of social and economic integration with that core (Census 2014).

Northeast New Jersey and portions of New York State are located in the New York-Newark Combined Statistical Area. This area is broken down into smaller metropolitan statistical areas (MSA). Morris County is located within the New York-Newark Combined Statistical Area and the New York-Newark-Jersey City Metropolitan Statistical Area U.S. Census 2014).

Due to the size of the New York-Newark-Jersey City Metropolitan Statistical Area, it is further divided into four metropolitan divisions which are separately identifiable employment centers within the MSA. Passaic County is part of the New York-Jersey City-White Plains NY-NJ Metropolitan Division labor market (Camoin Associates 2014). Figure 4-6 illustrates the different statistical areas in New Jersey and parts of New York State.

[illegible]





### 4.2.3 Population Trends

This section discusses population trends to use as a basis for estimating future changes of the population and significantly change the character of the area. Population trends can provide a basis for making decisions on the type of mitigation approaches to consider and the locations in which these approaches should be applied. This information can also be used to support planning decisions regarding future development in vulnerable areas.

Over the last 10 years, new regulations, new economic realities and changing conditions influenced the rate of population growth in Morris County and will continue to influence population growth moving forward. Enactment of the Highlands Act in 2004 and subsequent adoption of related NJDEP regulations is one of the reasons for the rate of population growth. These actions reduced the development capacity in most of Morris County since 89% of the County is in the Highlands Region. The addition of Highlands-specific environmental restrictions further reduces the development potential in the County. Continued support for open space and farmland preservation programs also reduced the availability of land for residential development and subsequent population growth. Demographic trends tend to influence overall population growth in the County. The number of households with children is declining in Morris County; however, the number of non-family and one-person households has been rising. Additionally, the local population continues to age. A continuation of these trends may suppress future rates of population growth. Lastly, the amount of available land for residential development is shrinking. With these trends and conditions, the County's population is currently projected to grow just 1.9% by the year 2020 (Morris County Planning 2013). Population growth projections is discussed later on in this section.

According to the U.S. Census Bureau Morris County's 2010 population was 492,276 persons, which is 4.69% decrease from the 2000 Census population of 470,212. From 1820 to 2013, the County has experienced a constant growth in population. Between 1810 and 1820, the County started seeing a slight decrease in total population before continuing population growth. The largest increase was seen between the years 1950 to 1960, when the County experienced a 59.16% (97,249 persons) population increase. The smallest increase was seen between the years 1980 and 1990, when Morris County experienced a 3.37% (13,723 persons) population increase. Since 1820, the County has seen a continual increase in population with the largest growth occurring during the middle of the 20<sup>th</sup> Century. Table 4-5 displays the population and change in population from 1790 to 2013 in Morris County.

**Table 4-5. Morris County Population Trends, 1790 to 2013**

Year	Population	Change in Population	Percent (%) Population Change
1790	16,216	N/A	N/A
1800	17,750	1,534	9.46%
1810	21,828	4,078	22.97%
1820	21,368	-460	-2.11%
1830	23,666	2,298	10.75%
1840	25,844	2,178	9.20%
1850	30,158	4,314	16.69%
1860	34,677	4,519	14.98%
1870	43,137	8,460	24.40%
1880	50,861	7,724	17.91%
1890	54,101	3,240	6.37%



Year	Population	Change in Population	Percent (%) Population Change
1900	65,156	11,055	20.43%
1910	74,704	9,548	14.65%
1920	82,694	7,990	10.70%
1930	110,445	27,751	33.56%
1940	125,732	15,287	13.84%
1950	164,371	38,639	30.73%
1960	261,620	97,249	59.16%
1970	383,454	121,834	46.57%
1980	407,630	24,176	6.30%
1990	421,353	13,723	3.37%
2000	470,212	48,859	11.60%
2010	492,276	22,064	4.69%
2013	499,397	7,121	1.45%

Source: U.S. Census Bureau, 2014

Note: Change in population and percent in population change was calculated from available data

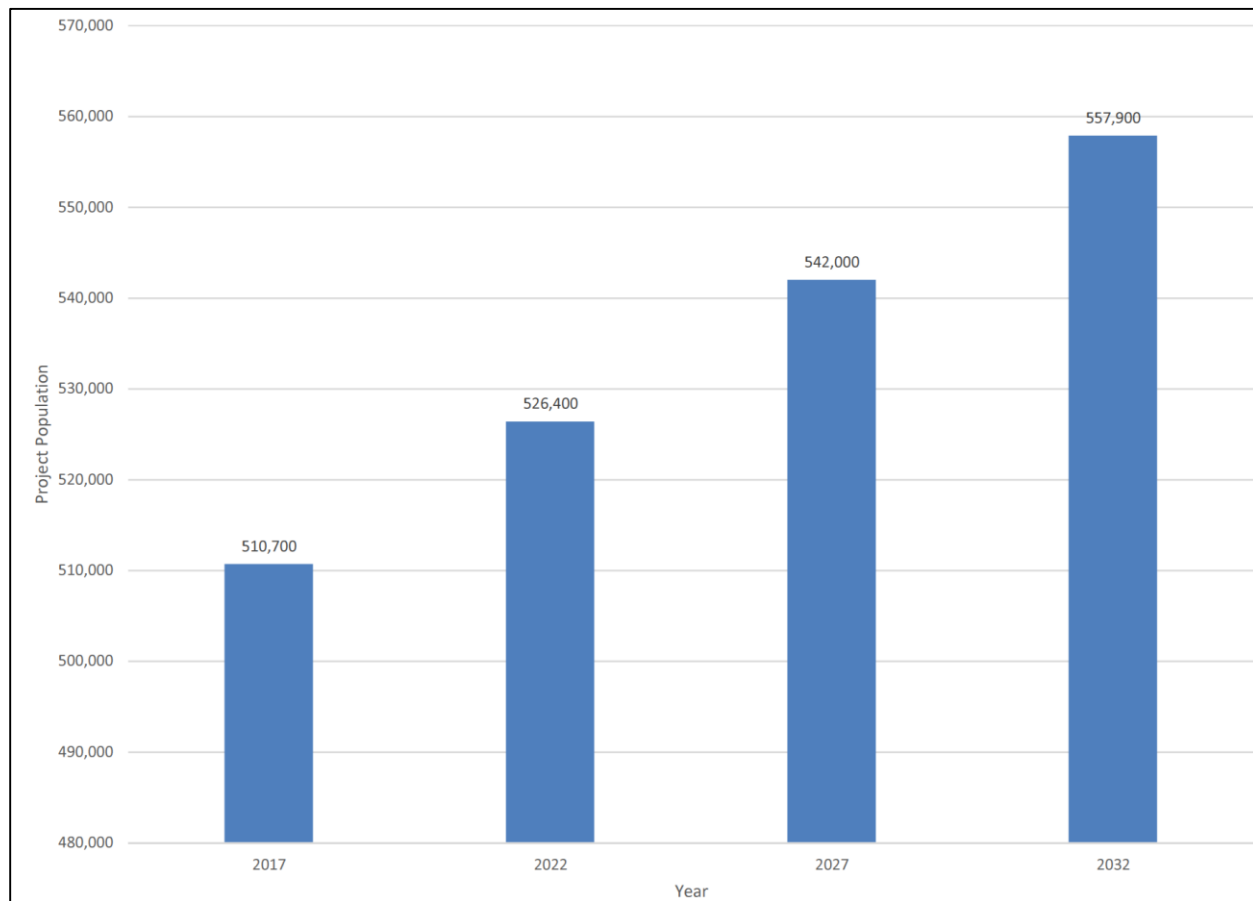
Table 4-6 displays the ten largest municipalities in Morris County. According to the 2010 data, the Township of Parsippany-Troy Hills was the most populous municipality in Morris County, comprising 10.8% of the County's total population.

**Table 4-6. Ten Largest Municipalities in Morris County**

Rank	Municipality	2010 Population
1	Township of Parsippany-Troy Hills	53,238
2	Township of Mount Olive	28,117
3	Township of Randolph	25,736
4	Township of Rockaway	24,156
5	Township of Roxbury	23,324
6	Township of Morris	22,306
7	Township of Montville	21,528
8	Township of Jefferson	21,314
9	Township of Washington	18,533
10	Town of Morristown	18,411

Source: U.S. Census, 2010

Over the next 15 years, from 2017 to 2032, Morris County has a projected population growth of 9.2% percent. Based on New Jersey Department of Labor population projections, the County population is expected to reach 510,700 by 2017 and 557,900 by 2032 (Figure 4-7).

**Figure 4-7. Morris County Population Projections, 2017 to 2032**

Source: New Jersey Department of Labor and Workforce Development, 2014

From 1970 to 2011, almost two-thirds of Morris County's population growth occurred in just seven of the 39 municipalities: Township of Mount Olive, Township of Randolph, Township of Roxbury, Township of Washington, Township of Jefferson, and Township of Rockaway. Over the same period of time, the Township of Mount Olive also led with the greatest percentage increase of 172%. As shown in Table 4-7, a majority of the County's municipalities experienced an increase in population, with the Borough of Riverdale seeing the greatest increase in population, 42.5%. The Borough of Chester experienced the smallest increase in population of just 0.86%. The Borough of Madison experienced the largest decrease in population between 2000 and 2010, with a 4.14% decrease, while the Town of Dover saw the smallest decrease in population, a 0.17% decrease.

**Table 4-7. Population Trends in Morris County by Municipality**

Municipality	2000 Census	2010 Census	Change in Population	Percent (%) Population Change
Town of Boonton	8,496	8,347	-149	-1.75%
Township of Boonton	4,287	4,263	-24	-0.56%
Borough of Butler	7,420	7,539	119	1.60%
Chatham Borough	8,460	8,962	502	5.93%
Chatham Township	10,086	10,452	366	3.63%
Chester Borough	1,635	1,649	14	0.86%



Table 4-7. Population Trends in Morris County by Municipality

Municipality	2000 Census	2010 Census	Change in Population	Percent (%) Population Change
Chester Township	7,282	7,838	556	7.64%
Denville Township	15,824	16,635	811	5.13%
Town of Dover	18,188	18,157	-31	-0.17%
Township of East Hanover	11,393	11,157	-236	-2.07%
Borough of Florham Park	8,857	11,696	2,839	32.05%
Township of Hanover	12,898	13,712	814	6.31%
Township of Harding	3,180	3,838	658	20.69%
Township of Jefferson	19,717	21,314	1,597	8.10%
Borough of Kinnelon	9,365	10,248	883	9.43%
Borough of Lincoln Park	10,930	10,521	-409	-3.74%
Township of Long Hill	8,777	8,702	-75	-0.85%
Borough of Madison	16,530	15,845	-685	-4.14%
Borough of Mendham	5,097	4,981	-116	-2.28%
Township of Mendham	5,400	5,869	469	8.69%
Township of Mine Hill	3,679	3,651	-28	-0.76%
Township of Montville	20,839	21,528	689	3.31%
Borough of Morris Plains	5,236	5,532	296	5.65%
Township of Morris	21,796	22,306	510	2.34%
Town of Morristown	18,544	18,411	-133	-0.72%
Borough of Mount Arlington	4,663	5,050	387	8.30%
Township of Mount Olive	24,193	28,117	3,924	16.22%
Borough of Mountain Lakes	4,256	4,160	-96	-2.26%
Netcong Borough	2,580	3,232	652	25.27%
Township of Parsippany-Troy Hills	50,649	53,238	2,589	5.11%
Township of Pequannock	13,888	15,540	1,652	11.90%
Township of Randolph	24,847	25,736	889	3.58%
Borough of Riverdale	2,498	3,559	1,061	42.47%
Borough of Rockaway	6,473	6,438	-35	-0.54%
Township of Rockaway	22,930	24,156	1,226	5.35%
Township of Roxbury	23,883	23,324	-559	-2.34%
Borough of Victory Gardens	1,546	1,520	-26	-1.68%
Township of Washington	17,592	18,533	941	5.35%
Borough of Wharton	6,298	6,522	224	3.56%





### 4.3 GENERAL BUILDING STOCK

The 2000 U.S. Census data identified 169,711 households (174,379 housing units) in Morris County. The 2010 U.S. Census reported 180,534 households (189,842 housing units) in Morris County. The County experienced an increase in both households and housing units from 2000 to 2010. As for households, between 2000 and 2010, the County saw a 6.4% increase. As for housing units, the County experienced an increase of 8.9% between 2000 and 2010. The U.S. Census defines household as all the persons who occupy a housing unit, and a housing unit as a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Therefore, you may have more than one household per housing unit. The median price of a single family home in Morris County was estimated at \$432,400 (U.S. Census, 2013).

For this update, the default general building stock in HAZUS-MH was updated and replaced with a custom building inventory for Morris County both at the aggregate and structure level. The building stock update was performed using the most current parcel and tax assessment data provided by the Morris County Geographic Information System Services. For the purposes of this plan, building footprints were also received from the County. The tax data associated to the parcels was spatial joined to the building footprints to gain an accurate building location for the Vulnerability Assessment; this resulted in approximately 185,799 structures with improved values. The improved value was utilized to estimate the building structure replacement value, which total approximately \$96 billion. Estimated content value was calculated by using 50-percent of the residential improvement value, and 100-percent of the non-residential improvement values. Using this methodology, there is approximately \$60 billion in contents within these improved properties. Approximately 90-percent of the total buildings in the County are residential, which make up approximately 71-percent of the building stock structural value associated with residential housing. Table 4-8 presents building stock statistics by occupancy class for Morris County.



Table 4-8. Number of Buildings and Improvement Value by Occupancy Class

Municipality	All Occupancies				Residential		Commercial		Industrial	
	Count	Improved Value	Estimated Contents	Total (Improved + Contents)	Count	Total (Improved + Contents)	Count	Total (Improved + Contents)	Count	Total (Improved + Contents)
Town of Boonton	3,210	\$1,457,301,260	\$902,505,444	\$2,359,806,704	2,840	\$1,664,387,447	206	\$263,574,856	60	\$265,769,756
Township of Boonton	1,853	\$1,054,314,439	\$603,540,055	\$1,657,854,494	1,667	\$1,352,323,151	50	\$34,427,756	15	\$76,547,881
Borough of Butler	2,725	\$1,135,469,854	\$682,689,218	\$1,818,159,072	2,494	\$1,358,341,909	157	\$221,969,358	22	\$96,263,688
Chatham Borough	3,245	\$1,327,968,537	\$784,801,195	\$2,112,769,732	2,950	\$1,629,502,024	215	\$274,440,554	44	\$62,895,336
Chatham Township	3,998	\$2,099,403,804	\$1,135,469,036	\$3,234,872,840	3,827	\$2,891,804,306	46	\$87,276,697	2	\$1,185,252
Chester Borough	859	\$463,303,287	\$334,729,449	\$798,032,736	545	\$385,721,513	182	\$289,000,048	0	\$0
Chester Township	3,587	\$2,412,577,533	\$1,350,758,112	\$3,763,335,644	3,041	\$3,185,458,262	113	\$127,995,497	9	\$322,838,243
Denville Township	7,032	\$3,563,818,505	\$2,123,394,460	\$5,687,212,965	6,424	\$4,321,272,137	311	\$563,144,607	60	\$405,497,182
Town of Dover	4,385	\$1,855,474,161	\$1,220,271,165	\$3,075,745,326	3,875	\$1,905,608,989	330	\$388,982,856	66	\$699,112,064
Township of East Hanover	4,776	\$3,225,617,098	\$2,176,279,135	\$5,401,896,233	4,277	\$3,148,013,888	253	\$1,271,691,827	138	\$327,816,526
Borough of Florham Park	3,722	\$2,384,920,542	\$1,606,922,715	\$3,991,843,257	3,415	\$2,333,993,480	171	\$887,770,764	16	\$922,576,276
Township of Hanover	7,045	\$3,892,006,627	\$2,690,767,686	\$6,582,774,313	6,328	\$3,603,716,824	386	\$1,583,375,996	138	\$322,838,243
Township of Harding	2,050	\$1,503,850,292	\$840,794,371	\$2,344,644,664	1,676	\$1,989,167,762	61	\$90,005,979	0	\$0
Township of Jefferson	9,281	\$3,243,744,317	\$1,830,589,001	\$5,074,333,318	8,596	\$4,239,465,949	397	\$429,632,476	30	\$27,638,417
Borough of Kinnelon	4,078	\$2,575,473,364	\$1,367,138,826	\$3,942,612,191	3,939	\$3,625,003,613	48	\$110,143,729	2	\$1,115,997
Borough of Lincoln Park	4,184	\$1,578,621,777	\$942,709,715	\$2,521,331,492	3,846	\$1,907,736,186	75	\$139,666,925	39	\$223,630,510
Township of Long Hill	3,515	\$1,690,599,454	\$995,729,639	\$2,686,329,094	3,184	\$2,084,609,446	167	\$277,880,989	52	\$111,043,221
Borough of Madison	6,235	\$2,527,368,462	\$1,510,850,273	\$4,038,218,735	5,693	\$3,049,554,564	285	\$444,406,712	23	\$15,768,467
Borough of Mendham	2,054	\$1,227,026,329	\$711,207,723	\$1,938,234,052	1,802	\$1,547,455,817	112	\$132,952,604	1	\$302,240
Township of Mendham	2,545	\$1,881,795,736	\$1,018,756,001	\$2,900,551,737	2,274	\$2,589,119,205	14	\$11,002,849	0	\$0
Township of Mine Hill	1,555	\$615,167,212	\$353,135,153	\$968,302,365	1,448	\$786,096,175	68	\$57,993,343	9	\$80,707,493
Township of Montville	8,066	\$4,968,934,467	\$2,966,574,465	\$7,935,508,932	7,405	\$6,007,080,006	267	\$449,944,780	112	\$999,277,261
Borough of Morris Plains	2,361	\$1,410,196,945	\$943,307,495	\$2,353,504,441	2,193	\$1,400,668,351	99	\$386,806,293	23	\$460,763,164



Municipality	All Occupancies				Residential		Commercial		Industrial	
	Count	Improved Value	Estimated Contents	Total (Improved + Contents)	Count	Total (Improved + Contents)	Count	Total (Improved + Contents)	Count	Total (Improved + Contents)
Township of Morris	9,488	\$5,292,581,229	\$3,130,649,406	\$8,423,230,635	8,778	\$6,485,795,471	215	\$795,915,503	149	\$479,034,878
Town of Morristown	4,935	\$2,423,804,905	\$1,707,446,571	\$4,131,251,475	4,061	\$2,149,075,002	638	\$1,469,937,136	17	\$36,345,322
Borough of Mount Arlington	2,303	\$1,100,750,349	\$597,755,766	\$1,698,506,114	2,186	\$1,508,983,750	43	\$107,206,175	2	\$1,242,893
Township of Mount Olive	8,525	\$4,700,404,870	\$3,026,114,840	\$7,726,519,709	7,741	\$5,022,870,090	263	\$721,753,548	115	\$1,336,925,417
Borough of Mountain Lakes	1,589	\$928,117,718	\$542,715,868	\$1,470,833,586	1,488	\$1,156,205,551	59	\$143,062,096	6	\$16,711,623
Netcong Borough	1,075	\$577,262,159	\$359,215,245	\$936,477,404	922	\$654,140,744	89	\$111,823,440	13	\$113,215,044
Township of Parsippany-Troy Hills	17,033	\$8,514,083,386	\$5,748,553,952	\$14,262,637,338	15,533	\$8,296,588,304	1,013	\$3,654,260,949	191	\$1,519,541,170
Township of Pequannock	5,586	\$3,034,459,545	\$1,869,528,895	\$4,903,988,440	5,087	\$3,494,791,950	245	\$398,431,132	25	\$201,896,630
Township of Randolph	8,375	\$5,212,226,320	\$3,070,794,831	\$8,283,021,151	7,755	\$6,424,294,468	255	\$608,615,501	72	\$594,471,247
Borough of Riverdale	1,155	\$736,335,484	\$510,244,848	\$1,246,580,332	956	\$678,271,908	136	\$373,398,562	40	\$122,995,329
Borough of Rockaway	2,580	\$1,087,960,104	\$716,193,967	\$1,804,154,071	2,157	\$1,115,298,410	286	\$367,648,682	52	\$144,545,461
Township of Rockaway	11,215	\$4,684,834,674	\$3,097,393,461	\$7,782,228,135	9,781	\$4,762,323,637	296	\$848,032,893	144	\$675,364,012
Township of Roxbury	9,408	\$4,069,706,358	\$2,531,387,293	\$6,601,093,651	8,509	\$4,614,957,195	544	\$1,197,871,660	105	\$311,163,752
Borough of Victory Gardens	338	\$85,038,516	\$53,802,341	\$138,840,857	311	\$93,708,527	17	\$31,440,454	7	\$8,792,982
Township of Washington	7,793	\$4,177,174,224	\$2,403,134,042	\$6,580,308,267	6,623	\$5,322,120,546	215	\$206,703,374	36	\$145,182,157
Borough of Wharton	2,040	\$1,018,114,011	\$681,283,911	\$1,699,397,922	1,854	\$1,010,490,300	103	\$177,584,327	15	\$437,842,420
<b>Morris County (Total)</b>	<b>185,799</b>	<b>\$95,737,807,854</b>	<b>\$59,139,135,568</b>	<b>\$154,876,943,422</b>	<b>167,481</b>	<b>\$109,796,016,857</b>	<b>8,430</b>	<b>\$19,737,772,929</b>	<b>1,850</b>	<b>\$11,265,062,919</b>

Source: Morris County





The 2009-2013 American Community Survey identified that the majority of housing units (66.5% or 126,422 units) in Morris County are single-family detached units. The 2012 U.S. Census Bureau's County Business Patterns data identified 16,724 business establishments employing 278,522 people in Morris County. The professional, scientific, and technical services industry has the most number of establishments in the County with 2,716 establishments. This is followed by the retail trade industry with 1,827 establishments and the healthcare and social assistance trade with 1,717 establishments (U.S. Census, 2011).

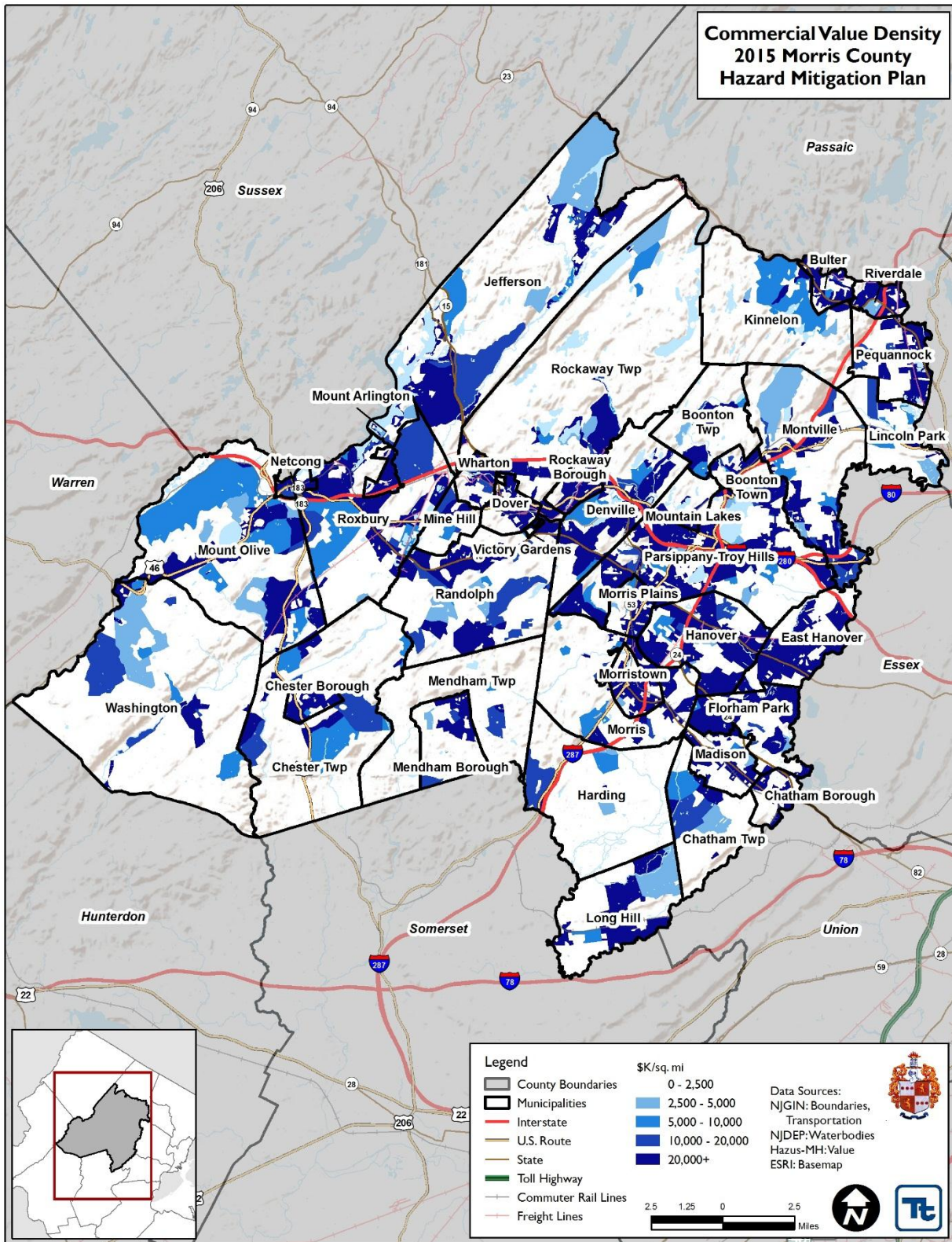
Figure 4-13 through Figure 4-16 show the distribution and exposure density of residential, commercial and industrial buildings in Morris County. Exposure density is the dollar value of structures per unit area, including building content value. Generally, contents for residential structures are valued at about 50 percent of the building's value. For commercial facilities, the value of the content is generally about equal to the building's structural value. Actual content value varies widely depending on the usage of the structure. The densities are shown in units of \$1,000 (\$K) per square mile. Viewing exposure distribution maps, such as Figure 4-8 through Figure 4-10, can assist communities in visualizing areas of high exposure and in evaluating aspects of the study area in relation to the specific hazard risks.

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Figure 4-9. Distribution of Commercial Building Stock and Exposure Density in Morris County

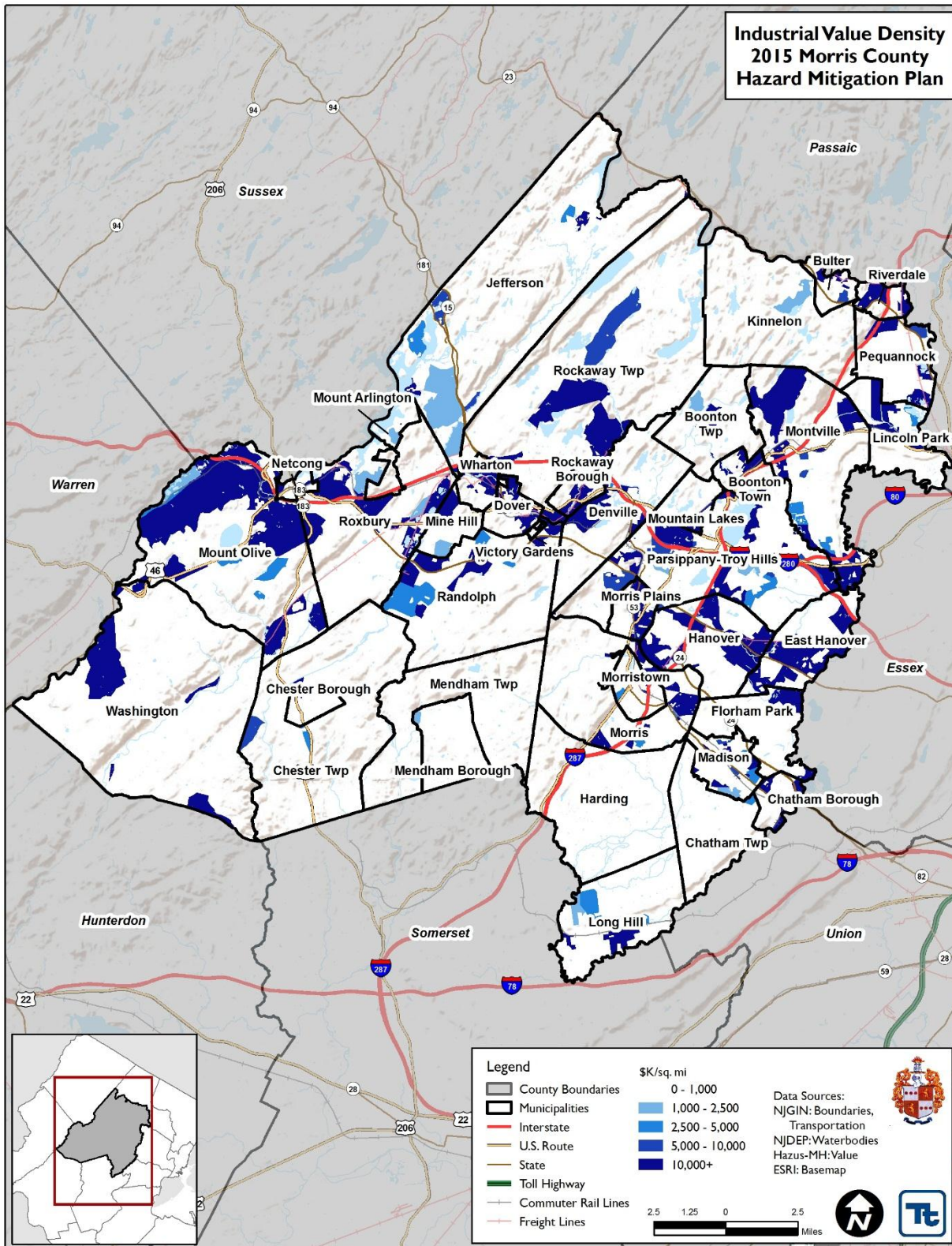


Source: Hazus-MH





Figure 4-10. Distribution of Industrial Building Stock and Value Density in Morris County



Source: Hazus-MH



## 4.4 ECONOMY

As discussed in the FEMA Local Mitigation Handbook, after a natural hazard event, economic resiliency drives recovery. An understanding of the major employers and economic sectors in the County whose losses or inoperability would impact the community and its ability to receive from a disaster is essential. The following provides information regarding the economy in Morris County.

### Agriculture

Agriculture is an important part of Morris County's economy and a major contributor to New Jersey's and the United States' farming industry. The 2012 U.S. Census of Agriculture indicates that Morris County ranked 10<sup>th</sup> in the State for total market value of agricultural products sold with over \$28.3 million in sales. This is a 4% increase from 2007 (\$27.3 million in sales). The 2012 average sales per farm was \$77,560, a 20% increase from the 2007 Census which was an average of \$64,720. The top commodities, by sales, in Morris County for 2012 include: nursery, greenhouse, floriculture, and sod at \$21.4 million in sales; vegetables, melons, potatoes, and sweet potatoes at \$3.1 million sales; and fruits, tree nuts, and berries at \$1.4 million in sales (USDA 2012). For details regarding agriculture and land use, refer to Section 4.1.1 of this county profile.

The Morris County Agriculture Development Board (MCADB) was formed in 1999 and focuses on farmland preservation and creating a positive climate for the farming business.

## 4.5 DEVELOPMENT TRENDS AND NEW DEVELOPMENT

An understanding of population and development trends can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place to protect human health and community infrastructure. DMA 2000 requires that communities consider land use trends, which can impact the need for, and priority of, mitigation options over time. Land use and development trends significantly impact exposure and vulnerability to various hazards. For example, significant development in a hazard area increases the building stock and population exposed to that hazard.

Local zoning and planning authority is provided for under the New Jersey Municipal Land Use Law, which gives municipalities zoning and planning authority. Refer to Sections 6 and 9 for further details on the planning and regulatory capabilities for the County and each municipality.

New development that has occurred in the last five years within the County and potential future development in the next five years, as identified by each municipality, is noted in the following table and figure. Refer to Section 9 which evaluates the potential new development exposure to natural hazards.

### Figure 4-11. Potential New Development in Morris County

Source:



## 4.6 CRITICAL FACILITIES

Critical and essential facilities are necessary for a community's response to and recovery from natural hazard events. A comprehensive inventory of critical facilities in Morris County was developed from various sources provided by the County. The inventory of critical facilities presented in this section represents the current state of this effort at the time of publication of the HMP and was used for the risk assessment in Section 5.

The inventory of critical facilities identified for the HMP is considered sensitive information. It is protected by the Protected Critical Infrastructure Information (PCII) program and under New Jersey Executive Order 21. Therefore, individual facility names and addresses are not provided in this HMP Update. A summary of the facility types used for the risk assessment are presented further in this section.

**Critical facilities** are those facilities considered critical to the health and welfare of the population and that are especially important following a hazard. As defined for this HMP, critical facilities include essential facilities, transportation systems, lifeline utility systems, high-potential loss facilities and hazardous material facilities.

**Essential facilities** are a subset of critical facilities that include those facilities that are important to ensure a full recovery following the occurrence of a hazard event. For the County risk assessment, this category was defined to include police, fire, EMS, EOCs, schools, shelters, senior facilities and medical facilities.

**Emergency Facilities** are for the purposes of this Plan, emergency facilities include police, fire, emergency medical services (EMS) and emergency operations centers (EOC).

### 4.6.1 Essential Facilities

This section provides information on emergency facilities, hospital and medical facilities, schools, shelters and senior care and living facilities. Figure 4-13 illustrates the inventory of these essential facilities in Morris County.

#### Emergency Facilities

For the purposes of this Plan, emergency facilities include police, fire, emergency medical services (EMS) and emergency operations centers (EOC). The County has a highly coordinated and interconnected network of emergency facilities and services at the county and municipal level. The Morris County Office of Emergency Management (MCOEM) serves as the primary coordinating agency between local, state and federal agencies. In response to an emergency event, MCOEM will work with County and municipal health agencies and healthcare providers, emergency facilities and the County Sheriff's Office to provide aid to residents of the County.

Each municipality is responsible for maintaining its own police department, fire department and emergency operation center. There are 38 enforcement facilities, 94 fire stations, 35 emergency medical services facilities and 43 emergency operation centers.

#### Correctional Facilities

There are no correctional facilities located within Morris County.

#### Hospital and Medical Facilities

There are eight major medical and hospital centers located within the County.

#### Schools

There are 249 schools ranging from pre-k to higher education learning facilities in the County. During an emergency event, schools can be used as a shelter for residents.





### **Shelters**

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There were 27 shelters identified within the County; many schools, community centers and municipal buildings could serve as a shelter during an emergency.

### **Senior Care and Living Facilities**

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It is important to identify and account for senior facilities, as they are highly vulnerable to the potential impacts of disasters. Understanding the location and numbers of these types of facilities can help manage effective response plan post disaster. There are 21 senior facilities located within the County.

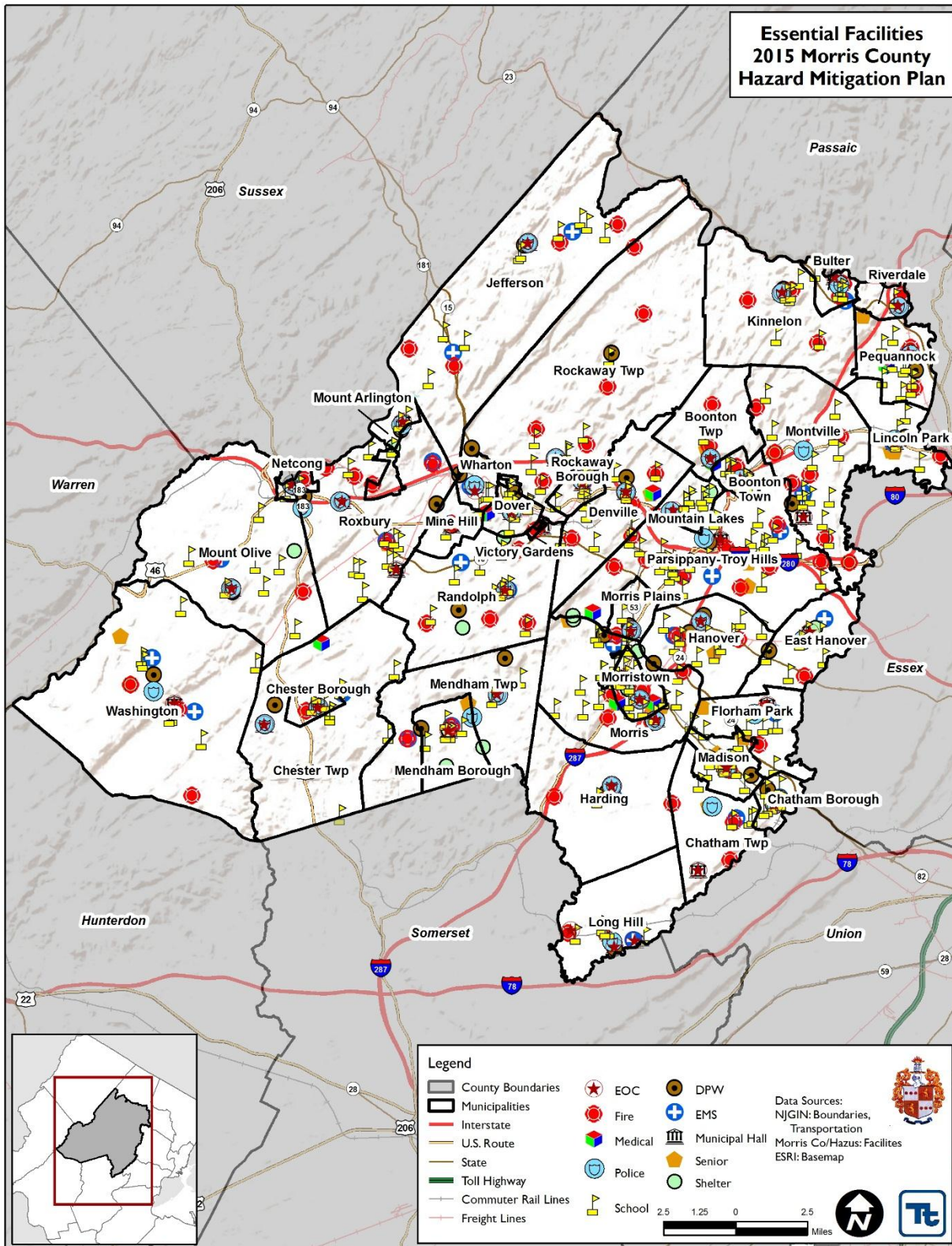
### **Government Buildings**

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In addition to the facilities discussed, county and municipal buildings, department of public works facilities and public health departments are essential to the continuity of operations pre-, during and post-disasters. These facilities are included in the risk assessment. There are 79 government facilities located in the County.



Figure 4-12. Essentials Facilities in Morris County



Source: Morris County, Hazus-MH



## 4.6.2 Transportation Systems

The County is bisected by a network of approximately 2,000 miles of federal interstate freeways, and state, county and municipal roads. Major interstate highways in Morris County included Interstate 80, 280, and 287, and State Routes 10 and 46. In addition to the roadways, the County is served by rail, bus and air, which are described below. Figure 4-13 illustrates the regional transportation lifelines serving the County. The transportation inventory included as part of this HMP includes airports, major bus stations, and major rail facilities.

### Rail Service

New Jersey Transit (NJ Transit), formerly Erie Lackawanna Railroad, serves thousands of County commuters each day. NJ Transit operates an extensive commuter rail network and offers connections with other rail service. NJ Transit service in Morris County include: Morris & Essex (Morristown Line), Morris & Essex (Gladstone Branch), and Montclair-Boonton Line. The Morristown Line and Gladstone Branch both have service to New York Penn Station, Newark-Broad Street Station, and Hoboken. The Montclair-Boonton Line provides service to Hoboken with connections to New York City (Morris County Transportation 2015).

Additionally, the Central Railroad of New Jersey, the Morristown & Erie Railroad, and the New York, Susquehanna & Western Railroad cross the County. There are 21 rail facilities located in the County.

### Bus Service

Overall, there are nine bus facilities located in Morris County. Bus service links the 39 municipalities in the County to the metropolitan region. NJ Transit operates a statewide bus system that includes service from Morris County to New York City Port Authority, local service within Morris County, and local service between Morris, Essex, and Passaic Counties (Morris County Transportation 2015).

Lakeland Bus Lines, Inc. provides service between Morris and Sussex Counties and New York City, including service to the Port Authority Bus Terminal, Midtown Manhattan, and Lower Manhattan. Lakeland Bus also provides local service within Morris County and between Morris and Sussex Counties. In addition, Community Coach, a member of Coach USA, provides bus service from Morris and Essex Counties to the New York City Port Authority Bus Terminal (Morris County Transportation 2015).

Other bus services in Morris County include the following:

- The Township of Parsippany-Troy Hills operates the Parsippany Free Transit System. This system provides two free bus routes within the Township and serves its residents. Both routes begin at the Morris Hills Shopping Center.
- The Town of Morristown provides Colonial Coach to its residents. This free service consists of one route operating in and around Morristown on Mondays, Wednesdays and Fridays.
- Morris on the Move (M.O.M.) is a community transportation service for low-income individuals running between the Town of Dover and the Township of Mount Olive. The service is sponsored by the Morris County Department of Human Services.
- TransOperations manages the Morris Avenue Direct Shuttle on the Madison Avenue (NJ-124) corridor in the Borough of Madison and the Township of Morris. The shuttle is funded through a Congestion Management Air Quality grant and the three colleges it services. It primarily serves the campuses but is open to residents and employees.
- The Morris Area Paratransit System (MAPS) is operated by the Morris County Department of Human Services and provides curb-to-curb transportation to County residents age 60 and older and to residents age 18 and older who have a physical or mental disability that includes functional limitations. In order



for residents to use MAPS, the Department of Human Services needs to be contacted (Morris County Transportation 2015).

### **Airports**

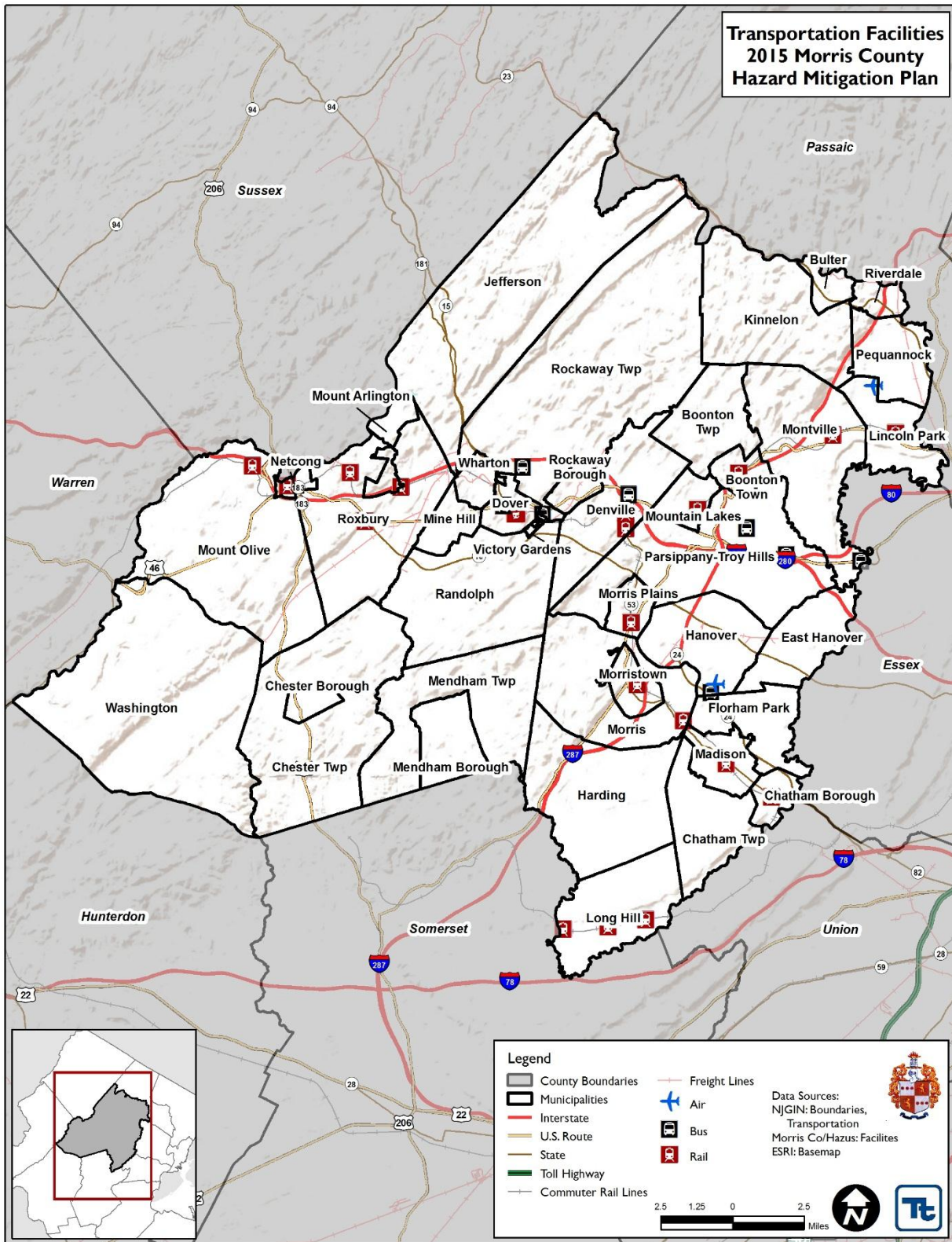
There are two airports located in Morris County. The Morristown Municipal Airport is located in the Township of Hanover and is used as a private airport for corporate and personal aircraft. The Lincoln Park Airport is located in the Borough of Lincoln Park and is privately owned airport with a flight school (Morris County Transportation 2015).

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Figure 4-13. Transportation Facilities in Morris County



Source: Morris County, Hazus-MH



### 4.6.3 Lifeline Utility Systems

This section presents communication, potable water, wastewater, and energy resource utility system data. Due to heightened security concerns, local utility lifeline data sufficient to complete the analysis have only partially been obtained.

#### Communication

Morris County has a network of both public and private communication facilities and towers. Telecommunication services are provided by multiple organizations, including Verizon, Sprint International, and TRANSCOM. There were nine essential communication facilities identified in the County.

#### Potable Water

Public community water supply systems in Morris County serve approximately 55% of the total County area and approximately 85% of the County's population. The water supply infrastructure generally serves areas that are also served by sewers. Individual onsite wells typically serve the more rural and less densely populated areas in the County. There were eight potable water facilities and 4 potable water pump stations identified in the County. The following table provides the water supply utilities in the County and the municipalities each serve.

**Table 4-9. Water Suppliers in Morris County**

Water Supplier	Municipalities Served
New Jersey American Water Company	Chatham (Twp), Florham Park (B), Harding (Twp), Mendham (B), Mendham (Twp), Long Hill (Twp)
Boonton Town	Boonton
Merry Heart of Boonton	Boonton (Twp)
Butler Borough Water Department	Butler (B), Kinnelon (B)
Chatham Boro Water Department	Chatham (B)
NJAW (Elizabethtown Water Co)	Chester (B)
Four Seasons	Chester (Twp)
Denville Township Water Department	Denville (Twp)
Dover Water Department	Dover (T), Randolph (Twp), Rockaway (Twp), Victory Gardens (B)
East Hanover	East Hanover (Twp)
Florham Park Water Utility	Florham Park (B)
Lakeshore Water Company	Harding (Twp)
Jefferson Township MUA	Jefferson (Twp)
Loziers Trailer Park	Jefferson (Twp)
Oak Ridge Mobile Home Park	Jefferson (Twp)
Mountain Shore Water Supply	Jefferson (Twp)
Jefferson Township Water Utility (Lake Hopatcong)	Jefferson (Twp)
Sun Valley Park Company	Jefferson (Twp)
Sandy Point Mobile Home Park	Jefferson (Twp)
Fayson Lake Water Co.	Kinnelon (B)
Passaic Valley Water Commissioners	Lincoln Park (B), Pequannock (Twp)
Pequannock Township Water Dept.	Kinnelon (B), Lincoln Park (B)
Madison Borough	Florham Park (B), Madison (B)



Table 4-9. Water Suppliers in Morris County

Water Supplier	Municipalities Served
NJAW	Mendham (B)
Roxiticus Water Company	Mendham (Twp)
Mine Hill Township Water Dept.	Mine Hill (Twp)
Montville Township	Montville (Twp)
Plausha Park Inc.	Montville (Twp)
NJAM	Florham Park (B), Morris (Twp)
Southeast Morris County MUA	Chatham (Twp), Hanover (Twp), Harding (Twp), Mendham (Twp), Morris (Twp), Morris Plains (B), Morristown (T)
Mountain Lakes Water Dept.	Mountain Lakes (B)
United Water	Mount Arlington (B)
Mount Olive Villages (NJ Vasa)	Mount Olive (Twp)
Mount Olive Water Department	Jefferson (Twp), Mount Olive (Twp)
Netcong Borough Water Dept.	Netcong (B)
Par-Troy Hills Water Dept.	Parsippany-Troy Hills (Twp)
Pequannock Township Water Dept.	Kinnelon (B), Lincoln Park (B), Pequannock (Twp)
MCMUA	Chester (B), Denville (Twp), Jefferson (Twp), Mine Hill (Twp), Mount Arlington (B), Mendham (B), Parsippany-Troy Hills (Twp), Randolph (Twp), Roxbury (Twp), Wharton (B)
Randolph Township	Randolph (Twp)
Riverdale Borough and PVWC	Riverdale (Twp)
Rockaway Borough Water Dept.	Rockaway (B), Rockaway (Twp)
Hoffman Homes	Rockaway (Twp)
Rockaway Township Water Dept.	Rockaway (Twp)
Picatunny Arsenal	Jefferson (Twp), Rockaway (Twp)
Roxbury Water Company	Roxbury (Twp)
Roxbury Township Water Dept.	Mount Arlington (B), Roxbury (Twp)
Cliffside Park Association	Washington (Twp)
Washington Twp MUA	Washington (Twp)
Sherwood Mobile Home Park	Washington (Twp)
New Jersey American Water	Chester (Twp)
Lake Stockholm Inc.	Jefferson (Twp)
Hackettstown MUA	Washington (Twp)

Source: Morris County Planning Board 2014 ([http://www.morrisplanning.org/wastewater/county\\_wide\\_summary.pdf](http://www.morrisplanning.org/wastewater/county_wide_summary.pdf))

### Wastewater Facilities

Centralized wastewater treatment systems in Morris County serve approximately 41% of the total County area and approximately 70% of the total County population. Centralized wastewater treatment systems treat flow collected from within their designated sewer service area (SSA). SSAs may include industrial businesses that discharge process wastewater into collection system for treatment by a facility not allowed by that business. The wastewater collection and treatment infrastructure generally serve the more densely populated urban and suburban communities. Rural and less densely populated areas of the County not served by SSAs are defined as general service areas (GSAs) and are predominately served by septic systems. There are not combined sewers



that include both stormwater and wastewater in the same system within Morris County. There were 24 wastewater facilities identified in the County.

### **Energy Resources**

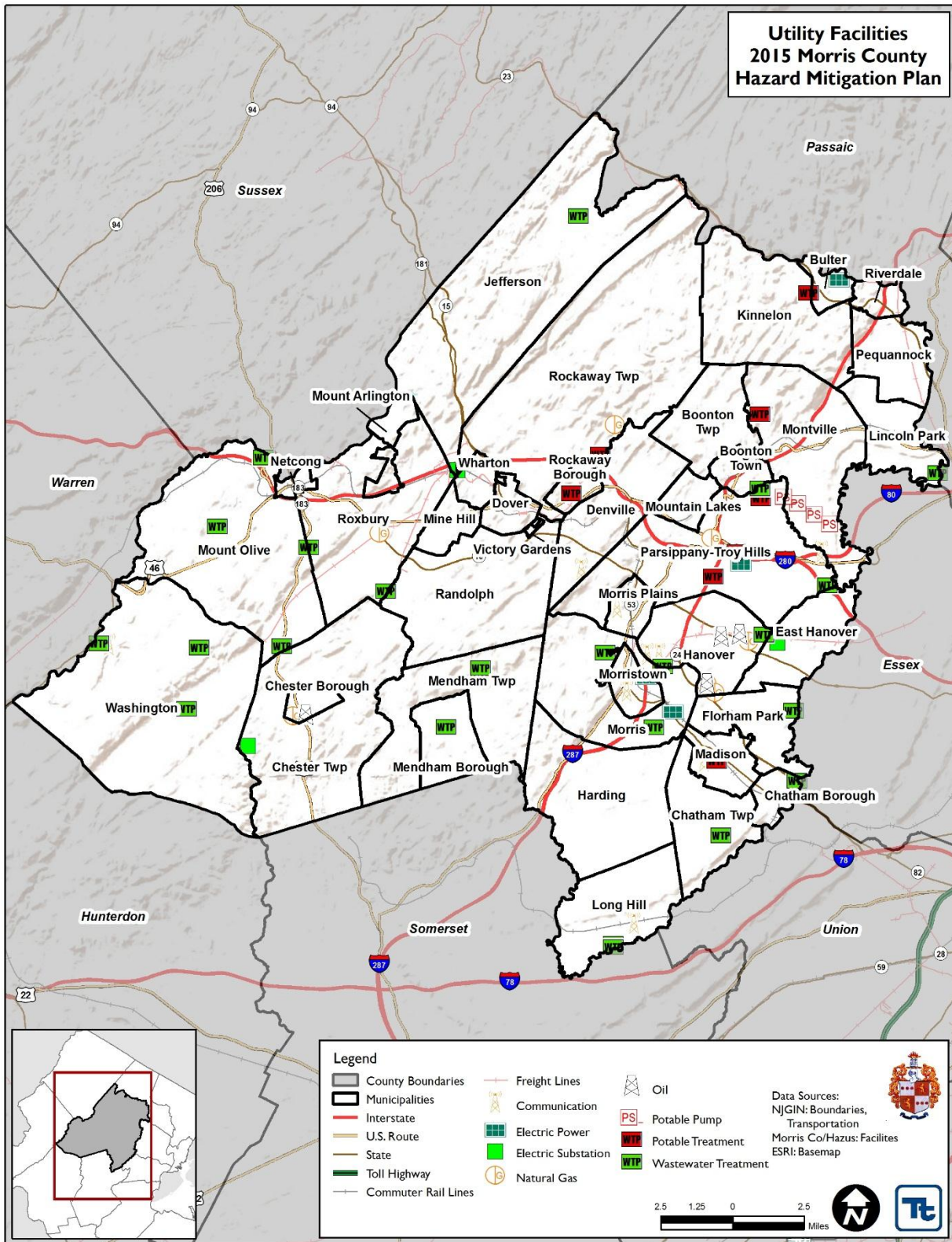
Jersey Central Power & Light (JCP&L) is the primary energy service provider for Morris County. Other service providers include Public Service Electricity & Gas (PSE&G), New Jersey Natural Gas, Transco Gas Transmission, Madison Electric Department, Elizabethtown Gas, Duke Energy, Columbia Gas Transmission, Butler Electric Company and Algonquin Pipeline Company. There were 7 electric generation facilities, three electric substations, seven natural gas facilities, and 5 oil facilities identified in the County.

A number of utility providers supply various services throughout the County as noted in Figure 4-14.





Figure 4-14. Utility Lifelines in Morris County



Source: Morris County, Hazus-MH



#### 4.6.4 High-Potential Loss Facilities

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High-potential loss facilities include dams, levees, chemical storage facilities and nuclear power facilities. Figure 4-15 displays the general locations of these facilities in the County. Dams are discussed further below.

##### Dams and Levees

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According to the New Jersey Department of Environmental Protection (NJDEP), there are four hazard classifications of dams in New Jersey. The classifications relate to the potential for property damage and/or loss of life should the dam fail:

- Class I (High-Hazard Potential) - Failure of the dam may result in probable loss of life and/or extensive property damage
- Class II (Significant-Hazard Potential) - Failure of the dam may result in significant property damage; however loss of life is not envisioned.
- Class III (Low-Hazard Potential) - Failure of the dam is not expected to result in loss of life and/or significant property damage.
- Class IV (Small-Dam Low-Hazard Potential) - Failure of the dam is not expected to result in loss of life or significant property damage.

According to the NJDEP Bureau of Dam Safety, there are 249 dams located in Morris County, 35 of which are classified with a high-hazard potential.

#### 4.6.5 Other Facilities

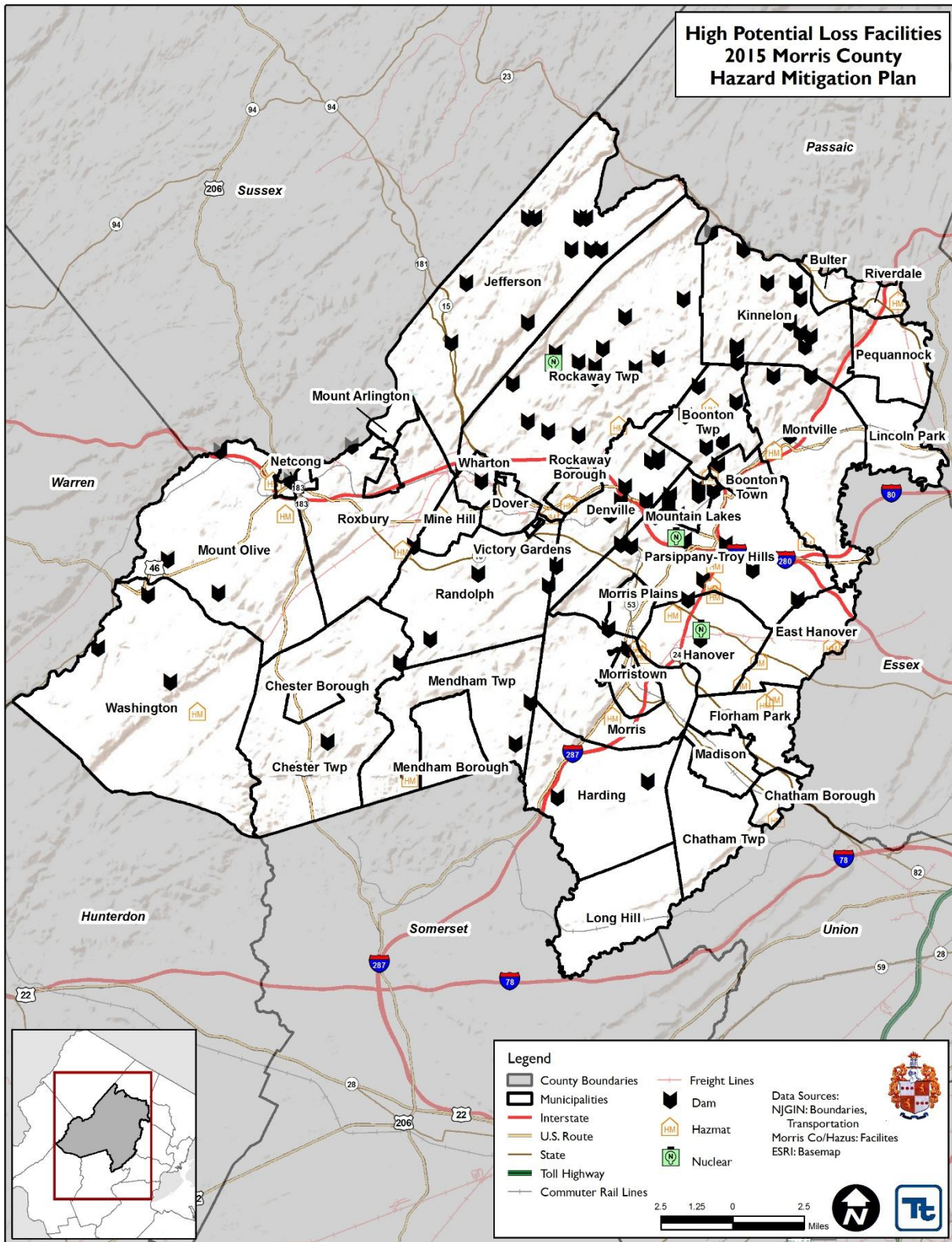
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The Planning Committee identified additional facilities (user-defined facilities) as critical. These facilities include but are not limited to additional municipal and county-owned facilities and essential commercial and retail locations. Figure 4-16 illustrates the general locations of these facilities in the County.





Figure 4-15. High-Potential Loss Facilities in Morris County



Source: Morris County, Hazus-MH





### Figure 4-16. Other Facilities in Morris County

